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International Management®

September 1961

METALS what's ahead for Cu, Zn, Pb, Sn, Al, and Ni

PATENTS finding a home for unused patents—even Russian ones

QUALITY CONTROL a way to greater efficiency

AIR CARGO who can profit from this month's new rates

TECHNOLOGY new countries need new designs

TRENDS keeping an eye on world currency problems in Vienna, a development plan in Chile, election eve in West Germany, European investment in the U.S., business in Brazil

for all these and more see contents, page 6

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World Affairs

Plan now on a united Europe

Every businessman must now plan on the basis of a single European trading area of 300-million consumers—not in the misty future, but in a few years' time (IM—Aug). That is the import of Britain's decision to seek membership in the Common Market.

An optimistic timetable would set British entry into the EEC on January 1, 1963. But 1964 is more likely—negotiations will be difficult. And remember that others of the Seven must arrange for full membership (Norway and Denmark, for example) or association (Sweden, Switzerland, perhaps Austria).

Can the unity move fail? You will know more after Prime Minister Macmillan and General de Gaulle have had their first extended talks. But Europeans are coming to believe that de Gaulle—despite his reluctance to see Britain dilute his political plans for Europe—cannot keep Britain out so long as London's entry conditions are reasonable. True, France could keep Britain out—but in doing so would risk breaking up the European Economic Community.

Money men at Vienna

There will be a lot of theorizing about strengthening world financial mechanics at this month's meeting of the International Monetary Fund in Vienna. But talk will not stop speculative attacks on the two "key currencies"—the pound sterling and the dollar.

In 1960, the dollar was the target. In 1961, pressure shifted to the pound (London's reserves dropped sickeningly in July). But now that the British have resorted to the classic remedy of tight money to defend their currency, it may be the dollar's turn once again.

Most government financial officials deplore these speculative runs. But they are not now likely to agree to any radical attempts to stop them. They believe drastic reforms—such as putting all reserves at the disposal of the IMF—would upset world finance.

You can expect the IMF to get additional reserves from "key currency" countries to help tide over nations in trouble. In effect, the IMF is now the "second line of defense." The first is the central banks, working together to moderate sudden flights of money.

This arrangement (IM—June,p3) has the advantages of flexibility and secrecy. For example, when the British raised their bank rate to 7%, word was passed that official funds should not be switched from New York to London—because that would aggravate the dollar's latent problems. The fact is that the dollar has looked better this year largely because of a weak pound.

In sum, the problem is not solved. For there is a growing body of financiers who believe that the dollar and the pound are attempting to do too much as world currencies, and like a rubber band they will eventually snap.

Director Khrushchev's dilemma

A problem familiar to managers of large businesses is hardly mentioned amid the current celebrations over the new Communist Doctrine. It is centralization versus decentralization.

Yet the U.S.S.R. is plagued by worsening problems in industry and agriculture. And Mr. Khrushchev is turning back to the old formula of running the economy from the top, "recentralizing" if you will. The decentralization experiment following Stalin's death led to duplication of effort, hoarding of resources, false reporting, dislocated planning. But centralization has in the past meant loss of local initiative, unrealistic planning, more "red tape" controls.

If the dilemma is difficult in the relatively free economies of the West, it is practically insoluble within the rigid structure of the U.S.S.R.

Brazil: Quadros revisited

A lot going on in Brazil in the seven months since President Janio Quadros took office. Many persons—including businessmen—have felt chilled by the wind of change. But talk to them now, and the consensus seems to be: "So far so good."

Major economic accomplishments include (1) obtaining a $1,500-million aid package (mostly a stretching-out of foreign debt) from the U.S. and Europe; (2) scrapping preferential exchange rates to put an important part of foreign trade on a free-market basis; (3) minimum prices to stimulate food output. These and other measures have eased Brazil's bad payments imbalance, caused a small but hopeful rise in exports other than coffee.

But they have also caused further rises in living costs and a credit squeeze on business. You see the signs: "Jobs offered" columns in the papers are 15% to 20% shorter . . . money costs 3% to 3½% monthly . . . collections are slowing.

And what about coffee? It is still critical—prices are down some, and so are shipments. But efforts

turn the page

Report from Chile

Last month, the American governments met in Uruguay to discuss President's Kennedy new "Alliance for Progress", in large measure dependent on Latin American "self-help" development efforts. The Chilean delegation came forward with an ambitious economic plan which they believe is a useful model for development. And the plan has merits, says the World Bank, which will soon be reporting on it.

This plan provides a non-political, balanced framework—a flexible guide, not a rigid schedule. It suggests a US$10,000-million investment program to be undertaken during the next 10 years. The goal is to raise Chile's standard of living by 20%, and its annual production growth rate from 3% to 5.5%.

The plan stresses private investment; and nearly US$500-million from private foreign sources is counted on (another $1,500-million is sought from foreign governments). Public investment is used to stimulate and supplement the private sector.

World businessmen may do well to give Chilean opportunities more careful study. For despite the troubles of the past decade, Chilean markets have been expanding. The largest share of the nation's trade is still with U.S.A., but other areas are increasing their percentage. Imports from Europe rose 23% last year.

This new program has a spirit of urgency. Chile has been plagued with runaway inflation, unemployment, and one of the lowest growth rates in the Western Hemisphere. Chileans demand a change.

Emphasis is on construction (US$2,530-million), industrial expansion (US$2,120-million) and transportation (US$1,450-million). Power development, agriculture and mining are next.

About half of the total financing is expected from private sources. Capital goods industries are high on the list; so are industries with export potential within the embryonic Latin American Free Trade Assn. (IM—Aug.), or elsewhere.

In the public sector, the government will invest 17% of the total in housing, agricultural reform, roads, public health facilities and education. The remaining 33% has been earmarked for industrial projects for which there is no private interest. Government officials admit that these public investments may have to be curtailed if the rate of inflation—this year held down to about 10%—again steps up.

The goals are lofty—the problems are many. And the economists and planners of the Chilean Development Corp.—better known as Corfo—know this well.

Efforts are being made to attract foreign investors. Will enough funds come? US$450-million have already been pledged by European, American, and international institutions. The rest is yet to be found.

Despite the apparent soundness of the plan, success will depend on whether Chile can solve problems such as:

A business psychology based on small turnover and 70% to 100% profit margins. Competition is discouraged.

A lack of social awareness among much of the wealthy class, who traditionally have opposed tax legislation based on "ability to pay". At present, 65% of tax revenues originate from indirect taxes, thus placing the burden on the poor. Also, Communist propaganda is finding eager listeners among discontented peasants who have heard much about agrarian reform but—until now—have seen little of it.

Political swing to the left is bringing foreign investments under fire in Congress. Tougher legislation, directed at the American-owned copper mines, may come.

Signs of more Chilean capital fleeing to Swiss and U.S. banks.

No development scheme can work as long as conditions like these—common to much of Latin America—prevail. And time is short.

to sweeten the cup are coming this month as the International Coffee Agreement sits down in Washington to work out a new stabilization plan. The U.S. has promised to join. But it is not clear what measures will be taken beyond a stricter policing of export quotas.

Inflation? It will go on. The rate depends on how tough the government will be on wage demands. So far labor has borne the brunt of the "austerity" and it is doubtful whether the government will choose to take a rigorous line now. Left to itself, business will not fight wage demands too hard—profits have been good.

Foreign investment? There is some hesitation on the part of new capital. Potential investors want to see how strict a profits-remittance law Quadros will sign. (Yet Daimler-Benz wanted to buy out the 50% interest in Mercedes do Brazil held by Brazilian interests, but got refused.)

Everyone is impressed by the smoothness with which Quadros has put across his economic measures. Some of the success is due to his foreign policy—which has created a dynamic outward-looking image of Brazil. Tolerance for Castro and "neutralism," closer relations with the Soviet bloc have taken much of the ammunition away from the leftist, anti-U.S.A. forces.

It's significant that in the same week President Quadros ordered reestablishment of diplomatic relations with Moscow, he accepted an invitation to visit President Kennedy in Washington.

And note a significant trend in trade development: Brazil is beginning to explore sales opportunities in Africa. A major appliance firm has surveyed Nigeria and Ghana, and reports promising prospects.

One foreign businessman in Brazil sums up the seven months: "It will take more than recognition of Russia or the fact that the Czechs supply a sugar mill to frighten us off. More important is: Can we make money? Is the political climate stable? So far, the answer to both of these questions is Yes."

American Letter

Berlin and the economy

Though no one in Washington expects war over Berlin, Mr. Khrushchev's December deadline provided a convincing argument for a stronger, better balanced defense posture. Hence the immediate favorable response from the nation to Mr. Kennedy's "stand firm" speech.

What does it all mean to business?

Start with the fact that business was good at midsummer, and getting better. Then the Congress approved the special $3,500-million appropriation for defense spending. To be sure, this is not a huge sum in relation to the U.S.A.'s gross national product—less than 1% of a GNP that may hit $530,000-million this year. And too, the effect of new defense money will not be felt for some months.

In an economy only recently emerged from a recession, there is plenty of slack to absorb new orders for the military—especially when much of it will go into conventional aircraft, vehicles, clothing, maintaining troops. The new business may help reduce unemployment, still a worrisome national problem.

So on the face of it, inflation should not be a threat. Yet additional spending in a year when the budget deficit may rise to $6,500-million raises old fears. You can expect Kennedy to use all his influence to keep wages and prices in line. But there is an inflation mood in Wall Street; and raw material prices may be difficult to influence. Though supplies are plentiful (tin is a glaring exception—page 15), industrial inventories are exceptionally low. If businessmen all decide at once to increase stocks, prices could surge.

Businessmen: some disenchantment

After an early flirtation with the New Frontier, businessmen are becoming somewhat disenchanted with the Kennedy Administration. This from a survey by *Business Week* magazine.

Critics are saying, "You can have all the money you need for defense, but something has to go." It is no time to pursue the millenium in social legislation—or in foreign aid to speed social reforms (as in Latin America).

Business is having doubts about Kennedy's understanding of business; and is dead set against any unnecessary spending. The Republicans in Congress will be much more militant in arguing against aid for education, housing, urban renewal, and other social benefits.

One result: Even needed reforms, such as overhaul of the tax system, may be put off indefinitely. Business is not likely to get any investment incentives; if anything, shareholders may lose their certain tax deductions on dividend income.

What about money?

Inflation talk sends investors into equity shares (note the sharp rise in prices following Kennedy's Berlin speech) over fixed-income securities. This in itself lowers bond prices and increases their yield. Furthermore, the government will have to borrow heavily in coming months—and raising rates would penalize itself. But there likely will be higher rates if an abnormal demand for loans develops, or if a lot of "hot" money" takes advantage of higher rates in London.

An outflow of short-term funds would hurt the U.S. balance of payments, though it is much improved this year. There is concern that the "export boom" may have passed its peak; also imports will inevitably increase as business improves and raw material stocks are built up. And larger forces in Europe automatically increase foreign expenditures. In short, well-informed Americans believe the dollar is still vulnerable (page 1).

An eye on Africa

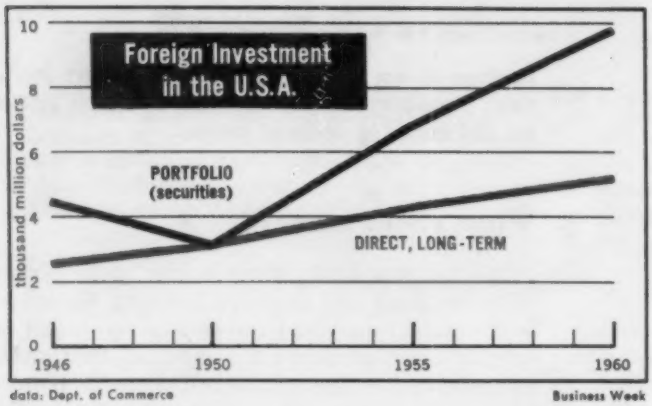
The U.S. Commerce Dept., currently on a foreign trade offensive, is trying to persuade American businessmen there are excellent opportunities in West Africa (Togo, Senegal, Mauritania, Mali, Niger, Dahomey, Upper Volta, the Ivory Coast). These markets are virtually untapped for goods ranging from air conditioners to road building equipment, Commerce officials say, and the former French colonies are trying to broaden their trade relations. Investment opportunities are also there—primarily in natural resources development.

Silver shortage?

Lots of talk about gold recently, precious little about silver. But now there is a debate in the U.S.A. about silver.

Again it is a case where the U.S. government, in its wisdom, pegs the price. Everyone agrees that world consumption exceeds production, but they part company on the potential effect of the imbalance. Some insist that when U.S. Treasury reserves—a buffer between supply and demand, steadying the

turn the page



data: Dept. of Commerce — Business Week

Opportunities in the U.S.A.?

Foreign investment in the U.S. now totals slightly over $15,000-million. Of this, about $5,200-million is direct, long-term investment in factories, land, businesses—and the rate of increase is $200-million yearly, compared to $70-million in 1950.

The trend is likely to continue; more money will be coming, especially from Europe. Most currencies are freely convertible, and Europeans have a new flexibility, able to move wherever they see opportunity for profit.

According to a survey by Business Week magazine, foreign companies make direct investments in the U.S. where they see a clear demand for their product or process, and where they feel they have a technological lead. Thus Montecatini of Italy, confident of its knowledge of polypropylene production, soon will be producing at a $10-million plant—even though the plastics market here is considered saturated. Philips of Holland has added to its U.S. manufacturing interests; so have the German chemical concerns. And British real estate investors are extending their stake.

Where the road ahead is not so clear, "explorations" are in order. Thus Courtaulds Ltd., the British fiber producer, bought a 4% interest in Koppers Co., strong in chemical technology, to look into areas of "mutual interest."

Most of the investment is being made by U.S. subsidiaries of the European industrial giants. And it is financed chiefly through internally-generated dollars, or—as with Montecatini and American Saint-Gobain—by going to the U.S. capital market.

This is of little help to the U.S. balance of payments, and Washington would like to attract more new money from Europe's growing reserves. One sign: The U.S. Dept. of Commerce last month opened an office to assist foreigners to find plant sites (and if possible, to steer them to depressed areas).

Will there be a rush into direct investment in the U.S.A.? Many foreign businessmen have doubts. They point to high U.S. labor costs, and what they term "too harsh" U.S. tax policies toward foreign investment. And, too, most European companies are so preoccupied by developments within the Common Market region that they have little time for the U.S.A.

But some investment bankers predict that once the Europeans have consolidated their positions in their growing home market, they will be moving rapidly into U.S. situations.

world prices—are used up, prices will soar. Other experts disagree. They say that secondary sources, which have always provided a flow of metal to market, will offset the production lag; prices will not surge upward.

The moral: Anyone who mines, sells, uses, or invests in silver should be alert to change.

Contract canning grows

Contract packagers, mostly small companies scattered across the U.S., have quietly built up a $100-million-a-year industry. They make and sell no products; instead they profit by packaging products for other companies. Last month, the first "big name" company entered the field: American Can Co. established a new division, Custom Packers, to fill cans for soft-drink producers.

American Can's main interest is in increasing the market for its cans. While the soft-drink industry used about 50% more cans last year than the year before, cans still accounted for less than 3% of the industry's 35,000-million containers (mostly glass). By scouring the country, American Can found six population areas where adequate canning facilities do not exist, plans to spend $6-million for new plant.

Many consumer products, such as shampoo and toothpaste and most aerosol-spray products, are now packaged by outside firms. Yet manufacturers do not like to talk about contract packaging because, as Business Week says, "They like the consumer to feel they have full control over their products from start to finish."

Stereo radio

By the end of the year, 79 U.S. radio stations will begin broadcasting with a new two-channel system, another 100 will begin next year. A new market naturally pleases radio manufacturers. But current opinion is that stereo radio will provide only minor good business, "an important extra."

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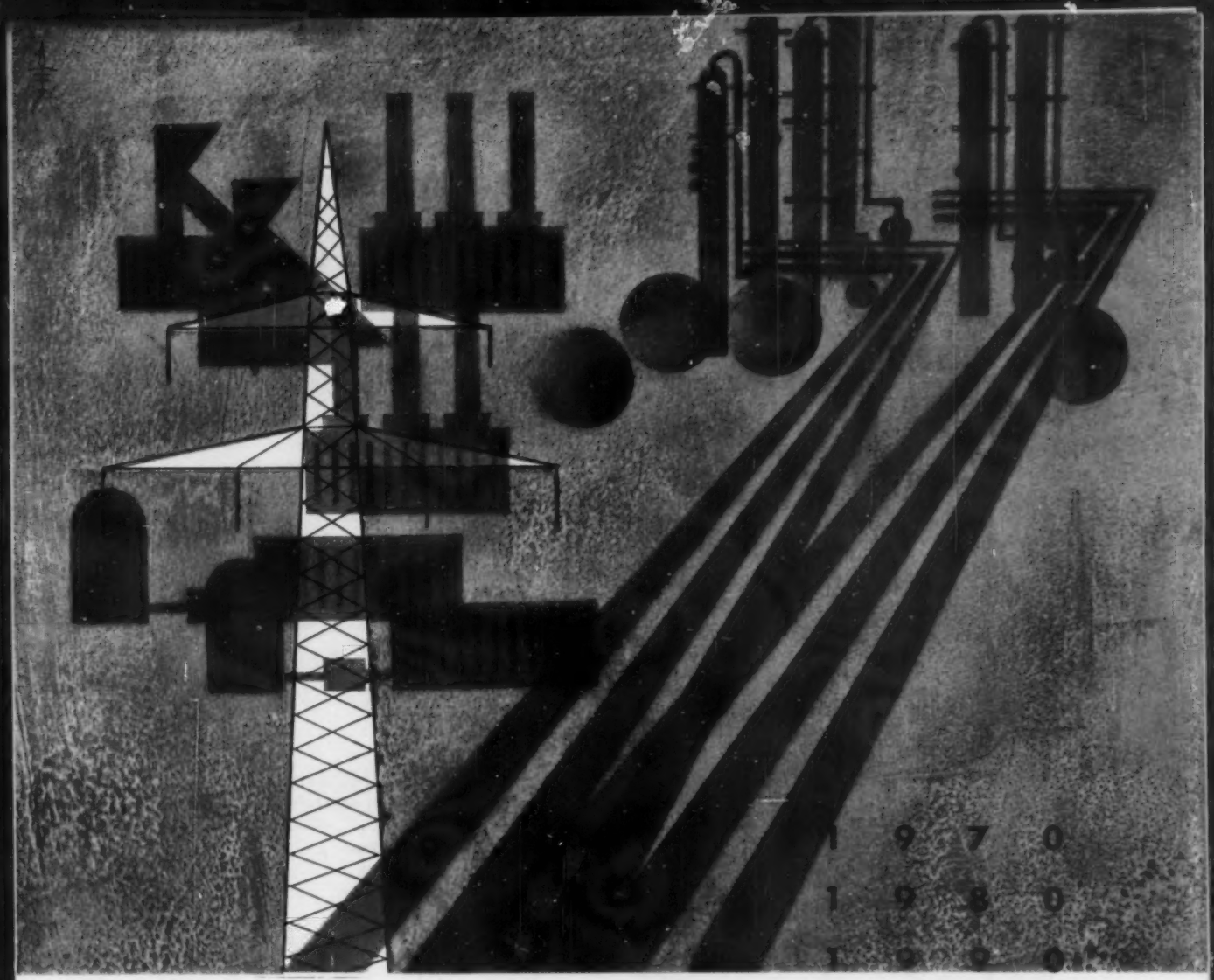

STEEL 2000

By the year 2000, the world population will probably have grown from 2.8 billion to more than 6 billion *). Huge energy reserves will have to be exploited to generate many times as much light, heat and power as is produced today.

From pipelines to engines and industrial furnaces, from mining props to power plants, from nuclear reactors to high voltage poles, steel determines the modern technique of energy production and supply.

On the road to the year 2000, the energy producing industry, like all other important fields of civilization, will have an immensely growing requirement of steel.

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***) According to population statistics compiled by the United Nations in 1958**

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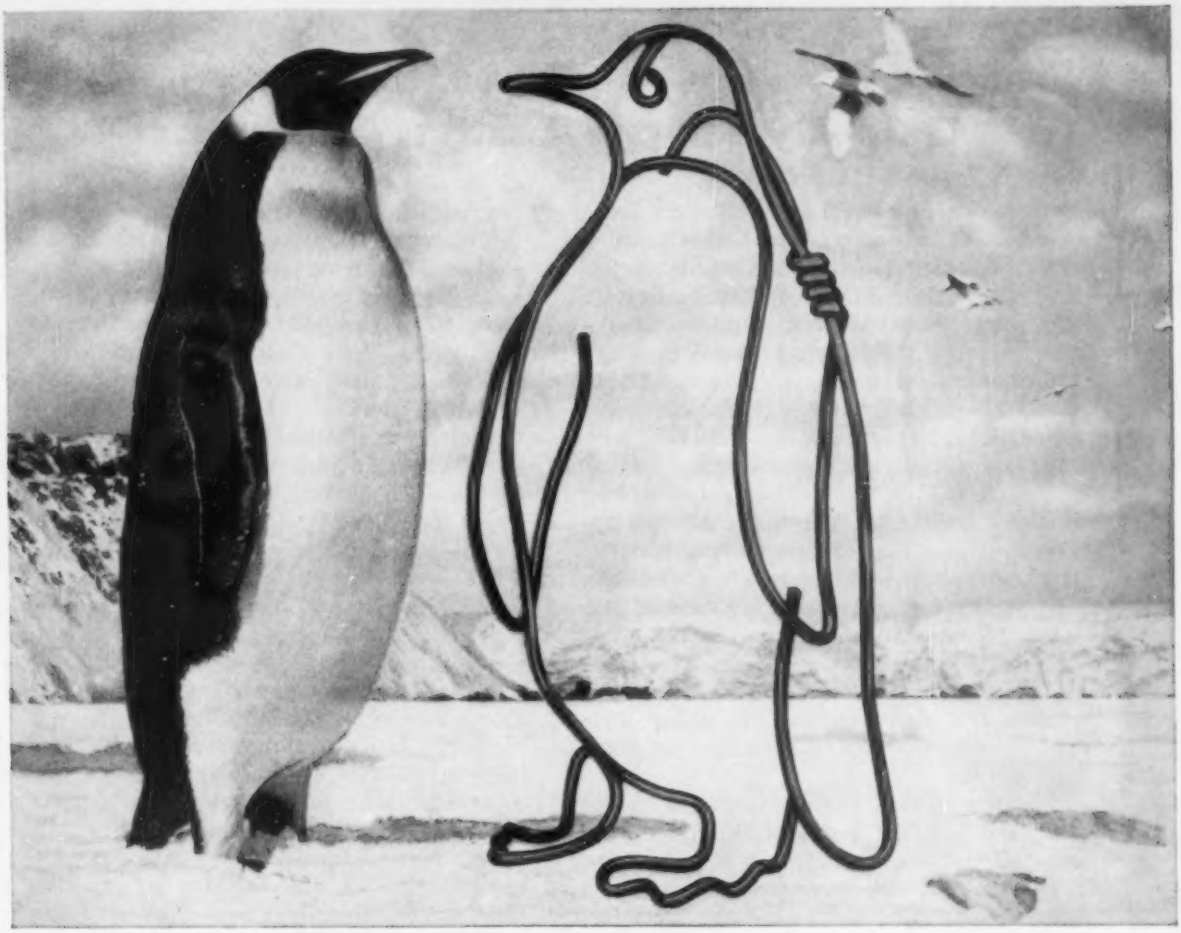

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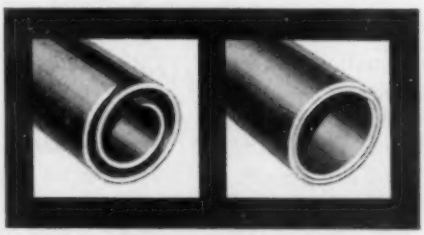

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Our Eyes on Latin America

THE EYES of the world are riveted on Latin America as never before. This sleeping giant of a continent has awakened, restless and perplexed, to a new spirit of urgency. In the face of the world's fastest rate of population increase things must get done—fast. Industrialization must be speeded, agricultural efficiency improved; social, political, and economic reforms must be initiated; new channels of trade, aid, and investment opened.

Despite the traditions of pan-Americanism, the new U.S.-Latin American "Alliance for Progress," and the occasional talk of Western Hemisphere trade preferences, it is a mistake to consider Latin America a "Yankee preserve." Thoughtful people in the U.S.A. do not want it so. Certainly Latin Americans do not want it so. Surely Messrs. Khrushchev and Mao Tse-tung are doing their best to prove that the North American colossus does not hold sway.

We believe that Latin Americans on the one hand, and Europeans, Asians, and Africans on the other have much to gain from increased contacts. Businessmen especially: The role of capital and technology from Europe (and, let it be said, Japan) is important in Latin America, and can become more so to everyone's benefit. Similarly, the developing nations of Asia and Africa have something to learn from Latin America's development experience, and something to contribute as well. For all its problems, Latin America presents immense opportunities for fruitful cooperation.

THERE ARE OPPORTUNITIES for a business journal, too. A publication such as International Management exists for one purpose—to serve the information needs of our readers. When it becomes possible to improve that service, conscientious editors are bound to seize the opportunity. Accordingly we at International Management are proudly (and busily) preparing for an important event.

Beginning with our January issue, we will publish in three editions, in three languages, to better serve our audience of businessmen. This English edition will be joined by International Management en Espanol, edited for Spanish-speaking Latin America, and by International Management para O Brasil, published in Portuguese, in Brazil.

As we plan these new editions we are doing more than practicing our Spanish and Portuguese. We are also hard at work preparing a broader, more useful diet of management, technical, and economic information directed specifically to the interests of Latin American business. All the staff of the McGraw-Hill organization—in Latin America, in Europe, Asia, Africa, as well as in the U.S.A.—are standing by for the task.

We are especially pleased that International Management will be joined in this venture by Industria, the McGraw-Hill publication that for 43 years has served the Latin American manager. Industria's facilities and its expert Latin American staff will be incorporated into International Management in January. We are confident that this concentration of talent and experience will greatly increase International Management's usefulness to you.

And here we are thinking of Eastern Hemisphere subscribers as well as our Latin American readers. We believe the International Management can help bring more information from the world business community to Latin America, and conversely, place the problems and opportunities of Latin America into clearer focus for our European, African, and Asian readership.

THIS MAY BE a good time to restate the editorial objectives that guide us. Simply this: to present each month a timely, objective, and useful report on international trade and economic developments, and on new management, technical, marketing, financial trends and techniques. We try to give our reader an idea of how the competitive winds are blowing; alert him to new ideas that he may adapt for his own or his enterprise's benefit; and, in a shrinking world, give him a sense of common purpose with businessmen everywhere. It is our conviction that an ever wider exchange of information among businessmen of all nations is the basis of mutual understanding and progress.

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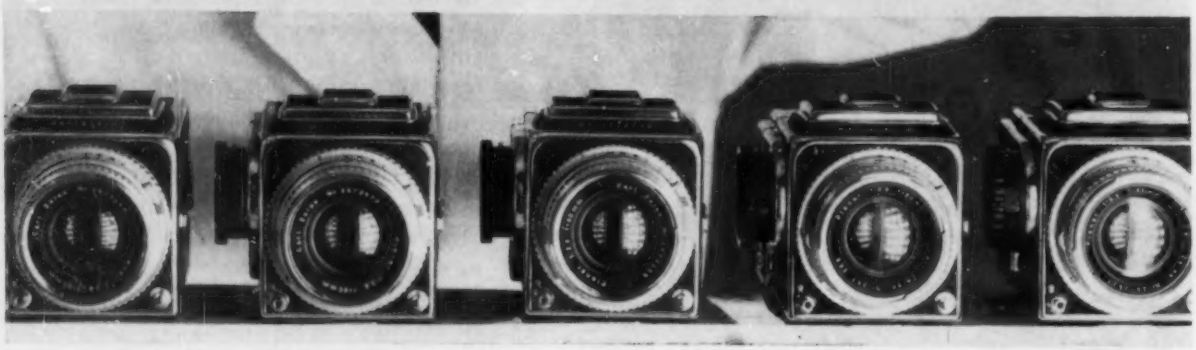

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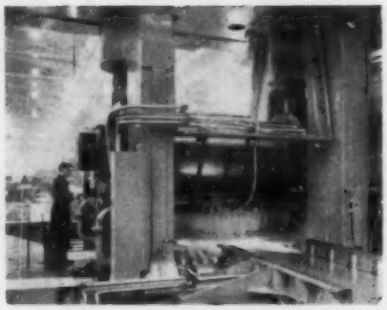

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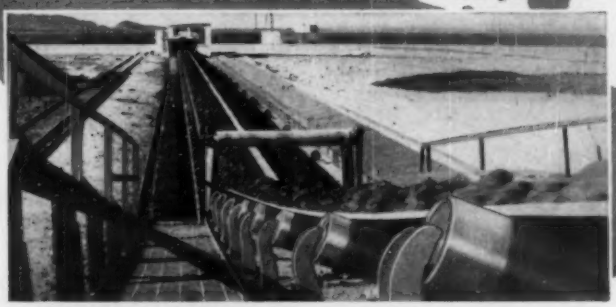

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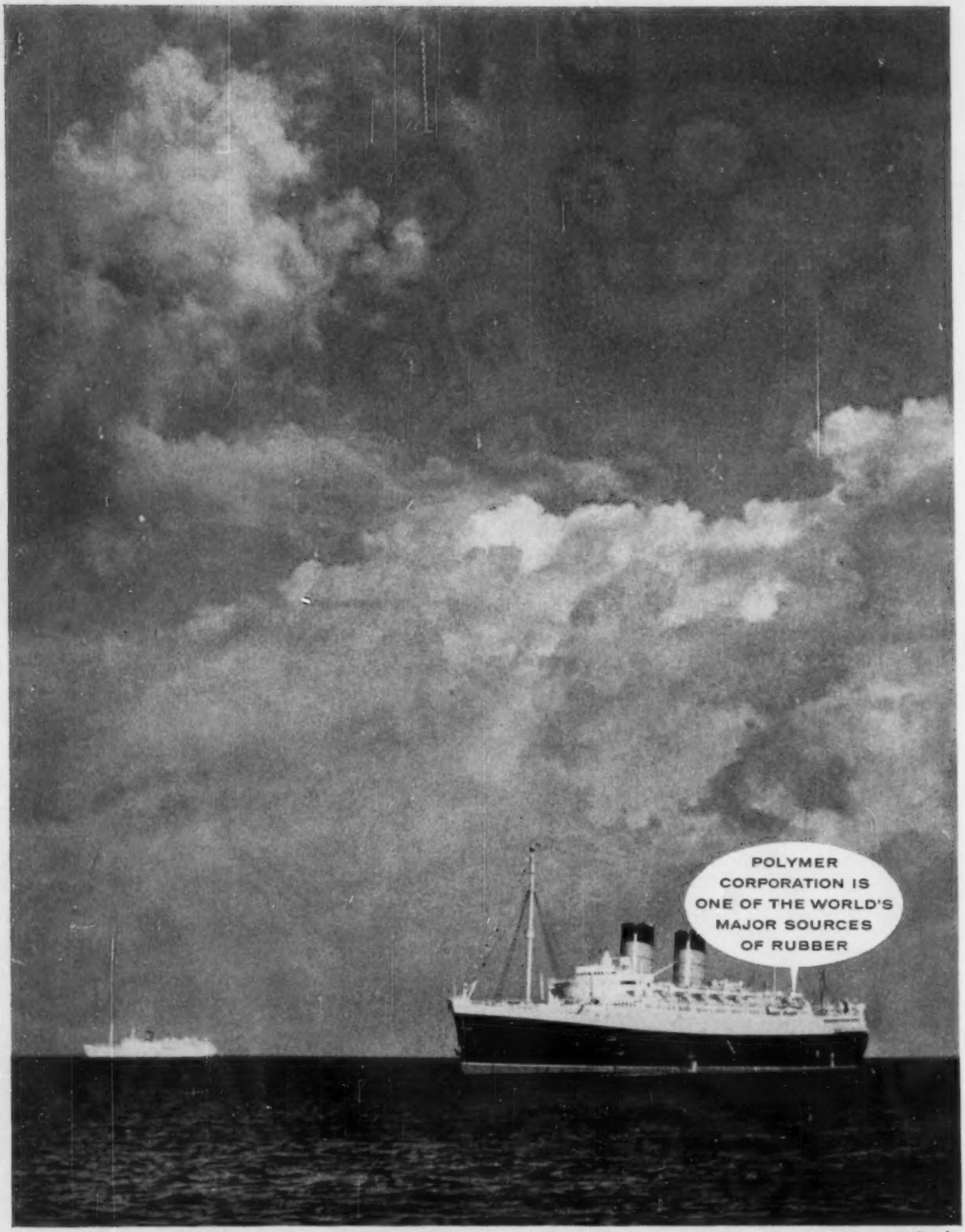

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Six Metals: Their Ups, Their Downs

Every day, everywhere in the world, the market behavior of copper, lead, zinc, tin, nickel, and aluminum affects business decisions, spelling profit for some, loss for others. So far this year their behavior has been, as usual, confusing—and more ups and downs are likely. Below is a review by a McGraw-Hill metals observer of what to expect in these important raw materials.

Cu World copper markets slowed considerably after a busy spring—but may provide some surprises right through the end of the year.

The most volatile of the nonferrous metals in a market sense, copper has had a history of violent price fluctuations, as demonstrated by its most recent ups and downs (charts, page 16). For the present, market observers are relaxing in a temporary security brought about by an easing of political and strike threats.

• **Separate**—To evaluate copper, remember that the U.S. market and all other markets must be considered separately. In the U.S., sales by "Big Three" producers—Kennecott, Anaconda, and Phelps Dodge—are made at the price quoted on the date of shipment. Sales made outside of the U.S. are usually based on the London Metal Exchange (LME) quotation at the time of sale. This is true, whether the metal comes from Chile, Africa, Canada, or the U.S.

Because the U.S. and foreign markets are linked, an American strike threat will cause the LME to rise; conversely, a decline in European buying will lower the LME and will cause decreases in the U.S.

In recent weeks major labor contracts have been negotiated with Kennecott, Anaconda and American Metal Climax in the U.S.; Chilean and U.S. dock strikes have been settled; and political threats in the Rhodesian Copperbelt and the Congo have eased.

• **Stable**—Prices were stable at 31 cents per pound in the U.S. and about 29 cents in London as INTERNATIONAL MANAGEMENT went to press. The U.S. tariff of 1.7 cents brings them very close together. Perhaps the most encouraging aspect of the copper market for world sellers is the increased buying by U.S. manufacturers. After a drop in the second half of 1960, when the U.S. producer price fell from 33 cents to 29 cents per pound, forecasters pessimistically saw the trend continuing in 1961. But a sharp surge in North American buying reversed the trend, and by late spring, world prices were back to their earlier levels. The price reversal is attributed to continued European economic expansion, political threats to copper production in the Congo and Rhodesia, and projected strikes in the U.S. and Chile.

Looking ahead, marketing men see a period of "semi-stability," and they predict that world supply will exceed demand until 1964 at the earliest. But they will keep constant watch on politics in Katanga Province in the Congo where copper mines are located. And they will worry about the Rhodesias as well, despite relative stability there.

For the short-term, the U.S. market continues to be firm, with U.S. manufacturers buying about 10% more than they had predicted earlier. World stocks of refined copper have been reduced substantially, and deliveries are now at a record level. For the first time in several years, extensive copper buying might in itself be the major influence in raising world prices. U.S. producers openly favor a return to the price of 33 cents per pound. But at the same time they are concerned with competitive factors — especially aluminum's spreading influence and attractive price.

Sn Tin is the only major nonferrous metal whose price is controlled by an international organization of producers and consumers. Ironically, the largest consumer of all—the U.S.A.—is not a member. The International Tin Agreement has done what it was set up to do, but its one weakness recently led to high prices.

The ITA is managed by the International Tin Council, sponsored by the United Nations. It works this way: Producing members put a certain amount of tin and cash in the hands of the Buffer Stock manager. His job is to maintain price stability. When the market rises above a certain level, he sells Buffer Stock tin on the London Metal Exchange to increase the world supply. When prices dip, he buys tin with his cash supply.

With removal from the market of excess metal to the Buffer Stock, a price decline is prevented. Action is mandatory at upper and lower extremes, optional at other levels. In periods of drastic oversupply, export quotas are placed on producing countries.

• **Shortage**—Such quotas were in effect until late 1960, when production in Bolivia, Congo, and Thailand began to fail, and consumption moved far ahead of supply. Quotas were cancelled, but a tin shortage had become a reality.

cont. on next page

Six Metals–cont. from p. 15

The Buffer Manager sold everything he had—and with this action became powerless to halt runaway prices. In the U.S. they moved from about $1 to $1.15 a lb.

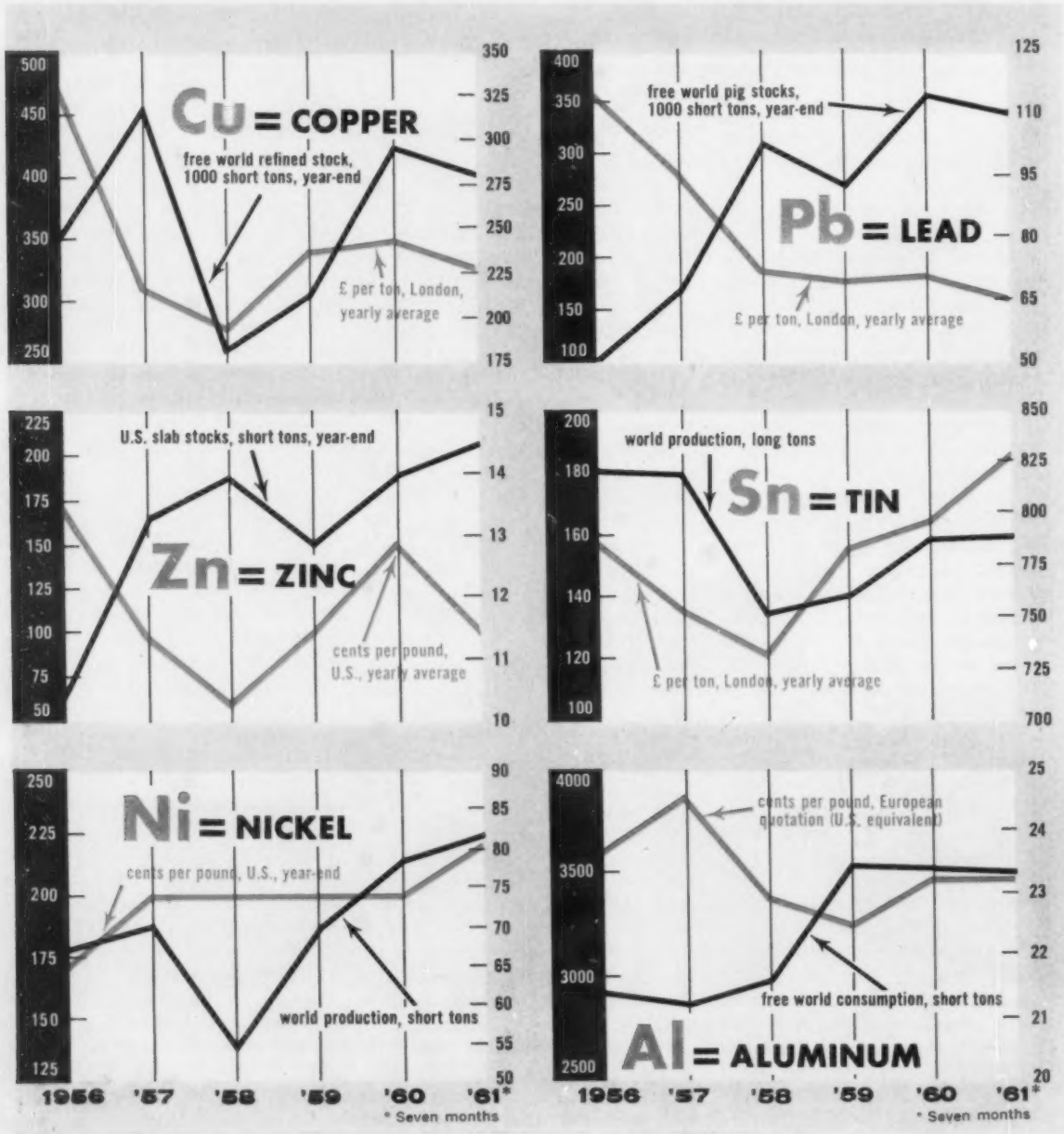
The good-natured American tinplater, the world's leading consumer, soon changed his smile to a frown. He had put up with artificial prices in the past in the hope of improving the economies of producing countries. With the upsurge in prices, he now began calling for release of some of the 400,000 tons of tin stockpiled by the U.S. government.

Some metal from a special lot of 4,000 tons has been released. World consumers hope that prices will drift off slightly of their own accord, but they fear that only release of additional U.S. stockpile tin will bring the market down to a fair level. That is up to the U.S. Congress, and will take time.

• **Tin can business**—Meanwhile, tinplaters are battling the aluminum industry for the can market in one of the most exciting marketing contests in recent history. High prices for tin are of no help in the battle.

Ni When the International Nickel Company of Canada (INCO), the world's leading producer of nickel and controller of the international price, raised its price per pound by 7¼ cents to 81¼ cents on July 1, there were many consumers—particularly manufacturers of stainless steel—who refused to believe it.

The increase was extreme, but not without precedent in the nickel market. The previous rise


Cu = COPPER
free world refined stock, 1000 short tons, year-end
£ per ton, London, yearly average
Pb = LEAD
free world pig stocks, 1000 short tons, year-end
£ per ton, London, yearly average
Zn = ZINC
U.S. slab stocks, short tons, year-end
cents per pound, U.S., yearly average
Sn = TIN
world production, long tons
£ per ton, London, yearly average
Ni = NICKEL
cents per pound, U.S., year-end
world production, short tons
Al = ALUMINUM
cents per pound, European quotation (U.S. equivalent)
free world consumption, short tons
1956 '57 '58 '59 '60 '61*
* Seven months

in December of 1956 had been 9½ cents to 74 cents per pound.

• **Shock** — Probably it was the timing of the increase that caused the biggest shock. No one was ready for it. Consumers believed that increased output from INCO's new plant, and benefits resulting from the Canadian dollar devaluation, would control the price.

But INCO explained that rising costs (up $50-million since 1957) were responsible for the increase. The company relented somewhat when it later announced that orders for future delivery made before July 1 would be charged at the old price of 74 cents per pound.

Observers are predicting that future increases will be smaller and more widely advertised in advance. The new price has not as yet been reflected in the stainless steel market.

Pb-Zn At the close of the United Nations sponsored Lead-Zinc Group meeting in Mexico City last March, a majority of the delegates agreed that the international price weakness of zinc was the result of an overabundance of U.S. stocks. But the U.S. insistence that its imports of over 100,000 tons a year maintained a world supply-demand balance went unheeded.

In the case of lead, nearly all producers immediately announced plans during the meeting to cut back production. Probably the biggest help to the lead market was the U.S. government's offer to return the metal to its barter list. Under this arrangement the U.S. will accept metal in exchange for its surplus agricultural products—with a couple of stipulations: Participants must first curtail output, and no metal produced after the end of 1960 will be acceptable. Canada and Australia—two of the world's largest producers—responded immediately.

• **Competition** — Problems other than that of heavy world stocks contribute to the low price situation of both lead and zinc. Neither population increases nor greater industrial production has been able to raise prices from their current depressed positions. Zinc is priced at 11½ cents per pound in the U.S.—2 cents lower than it was five years ago; lead is 11 cents per pound, five cents lower. In Europe, both quotations are down proportionately.

Lead and zinc have been hurt in recent years by competitive metals, and little has been done in the way of research and promotion to improve their position. Now the Lead Industries Assn. and the American Zinc Institute, as well as the International Lead-Zinc Study Group, are attempting to rectify years of shortsightedness. Their programs are ambitious and promising, and much of the opportunity for the improved health and growth of lead and zinc are dependent on them.

• **Caught**—The U.S. Administration, however, finds itself caught in the middle as far as lead-zinc policy is concerned. On the one hand it must assist U.S. industry where low profits hinder research or curtail small miners' output. On the other hand it is obliged to help support the economies of its allies in the West.

The present import quota system on both metals has failed to limit imports and permit higher prices. This is causing U.S. miners to seek higher tariffs. Smelters of the metals are less emphatic, since they require greater amounts of foreign ore for their operations. Small miners are also seeking aid in the form of subsidy.

The U.S. administration announced a rather nebulous policy in recent weeks. It would be willing to purchase and stockpile metal and perhaps subsidize small miners. But tariff increases were not approved. The industry at first complained that a purchase program did not halt imports. But with no hope of tariff help, it will probably accept the new policy of temporary aid.

Al Price stability and an unrelenting drive for new uses and public acceptance are responsible for the phenomenal growth of the aluminum market.

Production in the U.S.A. and Canada was encouraged by the military needs of World War II and the Korean War. Thanks partly to government subsidies and stockpiling privileges the industry was able to make a relatively easy transition to the civilian market. And until 1958, per capita consumption in the U.S. grew rapidly—demand ran consistently ahead of supply. But with the 1958 recession came a leveling-off, U.S. and Canadian stocks rose, and the industry felt unable to raise prices as it had hoped.

• **Look abroad** — Meanwhile, North American producers have turned to the virtually untapped world market. There are joint ventures with the big European producers, huge new aluminum projects in Africa, India, Australia. Everywhere the industry is battling to create new uses.

The price situation in aluminum is, in a word, peculiar. The light metal has captured important markets largely because of its relative price stability. Price rises in the U.S. and Canada (and they control international pricing except for the tariff factor, and, let it be said, except for the time two years ago when the Russians entered the market briefly) have generally been small. And the system seemed to work perfectly until 1958.

The U.S. market is now improving, but recovery has been slow. And the industry has not yet been in a position to lift prices. This is expected later this year because of mounting costs. But a rise outside the U.S.A. is less likely. The competition is just too keen.

• **Cutting**—Both U.S. and world markets have been hurt in the past few years by price-cutting. Unlike many other commodities, there are no "average" prices to determine the true activity of the market. Discounts have been common, and on some occasions cries of price discrimination have been heard (particularly in regard to those who supply molten metal to consumers large enough to command such service). And discounts have distressed the independent aluminum fabricators who must often compete in selling products with the large companies who supply him with metal as well as fabricate on their own account.

These wounds are partially healed, now that the market has improved. A round of drastic production cuts in the U.S.A. and Canada have had a good effect. But for all its dynamism—and its virtually unlimited future—the aluminum industry can expect plenty of growing pains. ●

Report from Bonn

Business and politics in Germany on election eve

The talk in this "village capital" is Berlin, the federal election September 17, and the slowing-down of business.

All three are tightly intertwined. First look at the *Wirtschaftswunder*, the "economic miracle." Two months ago the first signs that it might be slowing became apparent. Not that inflationary pressures have disappeared—most leading business indicators still point upward. But they are climbing at sharply reduced rates.

Exports are up only 9% so far; in the same period of 1960 they soared 21%. Domestic sales, up 15% last year, run less than 7% ahead. New orders have slowed down. Prices have been steady for six months.

This "cooling-off" of business is noteworthy because the German central bank is pursuing an easy-money policy. Troubled by Germany's embarrassingly high foreign exchange and gold holdings, Bank president Blessing cut the discount rate, relaxed reserve requirements.

Some officials opposed this policy, saying easy credit would feed inflation. But it has not. Inflows of foreign funds have been reduced, business has been restrained—but not too much.

A number of factors are involved. There is Germany's severe labor shortage which discourages business' expansion plans. Note, too, that capital equipment makers are quoting delivery dates of six months to two years. And there is last March's upward revaluation of the D-mark. By making exports more expensive, it has undeniably affected sales abroad. Conversely, cheaper imports have forced businessmen to hold down home prices, struggle harder for markets.

Chancellor Adenauer and his Christian Democratic party (CDU) are boasting of the steadier, yet prosperous, economic situation. But the old campaigner has taken out election "insurance" by seeing to it that the CDU put through a record amount of social legislation—something for nearly everyone—in the last sessions of Parliament.

It did so at some risk to Germany's international reputation. CDU pledges to keep high farm price supports made Germany unpopular with others of the EEC Six.

Mayor Willy Brandt of Berlin and his opposition Social Democrats (the SPD) recognize the appeal of CDU economic policies, and have thrown out most of their old Socialist notions. The two main parties here are not as far apart on economic issues as are the American Republicans and Democrats, and far closer together than Britain's two parties. Thus no matter who wins the election, few observers here expect a radical change that will affect business.

There was no doubt that Adenauer was the favorite as this report was written. True, there is grumbling about his age (85) and the lack of a successor. But succession is beginning to become clearer. While Economics Minister Erhard is the most popular politician, the "coming man," Germans say, is defense chief Strauss.

Brandt's prospects center on foreign policy. That means Berlin, and here the CDU and SPD split slightly. Both, of course, stand firm on Berlin. But the Socialists seem more flexible regarding negotiations with the Soviet, even raised the possibility of a reunited, neutral Germany. CDU calls this nonsense.

Yet there is very little war fear here. Most persons expect (wishful thinking?) that the Berlin crisis will fade back into its place as one of more sensitive points in a continuing cold war. And they say business will go on as usual—with one significant difference. The "miracle" economy has come of age, and will from now on grow subject to greater cyclical ups and downs just as any other mature, reasonably healthy economy.

Wanted:

A researcher questions the pace of the West's aid to the developing lands.

A COMPLEX steel mill built by the Germans at Rourkela, India, has been reported to be having operating troubles. But a few hundred kilometers away, at Bhilai, a simpler mill built by the Russians at about the same time has been running more smoothly.

Why? Many factors are undoubtedly at work. But among them may be the greater sophistication of the German mill. This in turn may reflect a certain amount of naivete on the part of planners, according to Jack Baranson, a staff research associate of the Committee for Economic Development, an influential organization of businessmen and educators in the U.S.A.

Writing in the *Harvard Business Review* (July-August, p 144), Baranson blames the shortcomings of various foreign aid efforts on a fallacy—the idea that the industrial West can magically transfer its advanced technologies to emerging economies not ready for them.

"We have built highly complex power dams and steel mills in rudimentary economies that, technologically speaking, are just out of the Dark Ages," he writes.

I. Lesson of History

The obvious alternative is to create or adapt technologies that will function immediately in an emerging economy. And that, in Baranson's opinion, is precisely what such recently industrialized nations as Japan and the Soviet Union have done, and what Communist China is attempting—with mixed results—now.

These countries did not hasten to copy outright the economies they admired. Instead, they borrowed what they thought would be most useful to them. They adapted, redesigned, scaled down in accordance with their own situation and needs. And they recognized early that where labor is cheap, mechanization often is more of a hindrance than a help.

• **Impatient**—Some emerging na-

Technology for Growing Nations

tions of today, pressing for their economic "take-off", refuse to take this approach. They are impatient to be fully industrialized, and they are intent on skipping over some of the necessary, if painful, first steps.

How do you help an impatient nation of this kind? The answer, Baranson says, is to design technologies that not only function immediately at the present level of a given nation's economy, but build a bridge to more advanced levels.

Baranson offers a three-stage approach to creating these new technical modes: (1) determine a nation's particular needs; (2) formulate these needs in terms that are meaningful to design engineers; and (3) establish public and private institutions to carry out the resulting programs.

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II. A Nation's Needs

Though all emerging countries have similar problems, each country also has its own particular assets and needs. These can be identified only by an on-the-spot study.

If by such a study it is determined that a country is ready only for small-scale power units, a giant power dam should be ruled out. Instead, the country may get its first commercial electricity from a series of solar units, fuel cells, fuel-burning generators, or well-designed windmills.

Cultural as well as economic patterns will determine the type of technology to be introduced. In some Asian countries, for example, it was found that the best way to make wheat flour acceptable was to simulate the taste, texture, and shape of the rice grain.

• **New Designs**—Engineers will have to come up with designs that reflect these economic and cultural needs. A transport plane to be used in a frontier economy, for example, must be versatile, sturdy, easy to maintain and repair. It must also adapt for service in cargo hauling, air-mapping, forest survey, pest control, geological and air-rescue operations.

All of these factors would help determine the design characteristics of a plane or other product, as would the specific physical, economic, and cultural conditions of the area in which it was to be used. The availability of fuel would be a major consideration. Rather than import large quantities of petroleum, some nations might find it more practical to power factories—and even vehicles—by burning rice stubble or cane bagasse.

The rice culture of Burma offers an example of how the particular needs of an area might be translated into design characteristics. Quick answers to Burma's problems lie less in mechanization than in better labor-intensive equipment—and improved methods of soil preparation, cultivating, transplanting, harvesting.

• **Agencies**—Translating needs into designs should be the combined task of organizations in both the industrial and emerging nations. National research groups in the developing country would be in the best position to study and evaluate local needs, Baranson suggests. These needs then could be translated into equipment and techniques by public and private groups in the U. S., Europe, and Japan.

Designing equipment for strange environments is not new to industrial research teams. During the war engineers quickly came forward with vehicles and tools for the desert, the Arctic, the Burmese jungle. And now equipment is being made ready for the even more rigid requirements of space flight.

Baranson suggests that even products of space research could be of help to developing nations. Much of what space researchers have learned might help them in designing small-scale, maintenance-free equipment—radios, power units, small engines and so forth. Stretching his imagination further, Baranson notes that communication satellites now under study (IM—June, "Technology") could lead to massive educational programs that would reach remote areas by television.

Baranson's views will not be popular in many proud nations in a hurry to equip themselves with the tools of modern, mass-production industry. But he argues that they will profit little from receiving obsolete or new, but unadapted, technology from industrial lands. What they need, says Baranson, is "newly-fashioned" technology "custom-tailored" to their needs. ●

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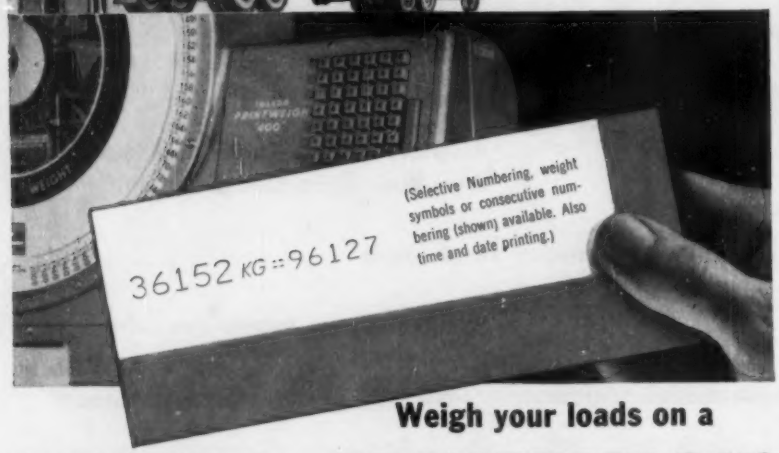
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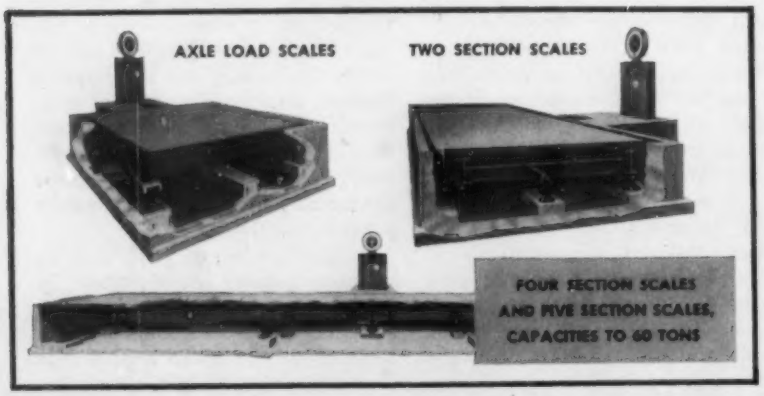

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MARKETING

Air Cargo

While new air cargo rates will induce many world traders to ship in greater volume, some cargo bills will increase.

THIS MONTH, new air cargo rates are in effect on routes across the North Atlantic and from Europe to Latin America. And as INTERNATIONAL MANAGEMENT went to press, Pacific carriers had approved changes in their rate structure—to go into effect this month following ratification by their respective governments.

This world-wide trend toward lower rates is the inevitable result of (1) the aviation industry's need to fill the cargo holds of the growing number of spacious jet transports and the expanding fleet of all-cargo aircraft (IM—July, p 16), and (2) the growing demand of international marketing men for cheaper air cargo.

I. The North Atlantic

The most important and talked-about rate changes are those on the North Atlantic route—the world's busiest and richest. But the rates, approved by International Air Transport Association (IATA) last May, are being received with mixed emotions, not only by shippers but by freight forwarders and by the airlines themselves.

As Alvin B. Beck, president of Air Express International, states, "there are glaring defects in the new rate structure". He cannot see "a concerted rush by shippers to overwhelm us with business in big volume."

Specifically, here is what the shipper should know about the new North Atlantic rates:

—The minimum charge per shipment has been raised to $11, both ways, between Europe and the U.S.

—General commodity rates start at $2.20 per kilo (New York-London) and scale down to 72 cents per kilo as the weight of the shipment increases.

—A new weight level has been added for general commodities from

Now Costs Less . . . for Some

Europe to the U.S. only: for 7,500 kilos and over, the rate is 68 cents per kilo. (See chart for newly-established rates.)

• **Volume business**—Before the new rates became effective, air cargo charges were based primarily on specific commodity classifications. Commodities were separately weighed and a specific rate was applied. To encourage volume shipping, the specific commodity classifications have been reduced from 78 to 15 on eastbound traffic, 24 on westbound traffic.

Weight is now the prime consideration. If a shipment does not fall within any specified commodity group, it is shipped under the new general commodity classification. This means that a number of commodities can be combined by a freight consolidator under one general rate and shipped at a substantial saving. If the product still falls under the specific commodity rate, it will generally not be affected by the new rate change. Such products include textiles, auto parts, photographic equipment, adding and computing machines.

• **Reaction**—World traders' reactions to the new rates vary—depending on their business. The new rates benefit some companies while others lose. A few products which used to fall under a specific commodity classification will now gain by the new system. Pharmaceutical manufacturers, for example, formerly shipped their goods at 55 cents per kilo for 100 kilo shipments under a specific commodity classification. Now, they ship at a rate of 41 cents per kilo for 100 kilo shipments under the new general commodity rate.

On the other hand, shippers of some machine parts may see a general increase in their air cargo bills unless they ship in much greater volume. Their specific commodity rate, which has also been dropped, was less than the new general rate for shipments of 100 kilos. To profit by air cargo shipping, this commodity must be shipped in large quantities.

INTERNATIONAL MANAGEMENT talked with a number of businessmen about the new rates. Here is a sample of their opinion:

An airline executive comments: "The rates are not low enough. The breakpoints favor the consolidator and the specific commodities do not . . . But generally it's an improvement . . ."

Mr. Raymond J. Graulich, traffic manager for Time-Life, International, publishers, says that carriers "have not come up with the right solution . . . Too little has been done on freight rates from one foreign point to another."

"They have missed the boat," comments James E. McGuire, traffic manager of IBM World Trade Corp. For most of his products, air cargo is very much in competition with surface shipping. He says it will take a rate of 66 cents per kilo for air cargo to attract big volume.

II. The Pacific

Pacific airlines have brought their rates more in line with those of North Atlantic carriers. They feared that new Atlantic rates might take away a part of their business. For example, traffic originating in New York, bound for the Orient, could choose the Atlantic at the expense of Pacific carriers. Now, rates will be more nearly competitive across both oceans.

The Pacific rate structure is based mainly on a "weight break" system; goods are shipped mainly by weight rather than by commodity. Weight breaks formerly were at the following kilo levels: 0-44, 45-249, 250-499, 500-2499, and 2500-10,000.

Now there are two new weight breaks, one at the 100 kilo level for goods moving in both directions, and one at the 1000 kilo level for eastbound goods only. Also the 10,000 kilo level has been reduced to 7,500 kilos. Net result is a lowering of cargo rates for shipments between 100 and 250 kilos, between 500 and 1000 kilos and between 7500 and 10,000 kilos.

General commodity rates (per kilo) New York-London
(effective Sept. 1, 1961)

Kilos	new rate	old rate
0-44	$2.20	$2.81
45-99	1.52	2.11
100-249	1.10	2.11
250-499	.90	2.11
500-999	.80	1.83
1000-7,499	.72	1.83
7500 and over	.68	1.83

III. Latin America

The new North Atlantic rate structure also provides for rate changes on the Europe-Latin America trade route.

Because the bulk of air cargo traffic flows from Europe to Latin America on this route, rates were revised in that direction only. Latin American exports to Europe are generally bulk commodities—agricultural products and metals, obviously not candidates for air cargo now.

Note these changes:

—All specific commodity classifications to the Caribbean area have been abolished except for foodstuffs, textiles, and periodicals. (There are still about a dozen commodity classifications to South America.)

—As the size of the consignment increases, rates decrease. For example, from Amsterdam to Buenos Aires, the general commodity rate at 45 kilos remains unchanged at $5.33 per kilo. But for a shipment of 1500 kilos the rate drops from $3.95 to $2.31 per kilo.

—Airlines can now take advantage of the new North American rates by shipping their cargo via the U.S. rather than flying direct to Latin America. A 45-kilo shipment of auto parts from Amsterdam to Caracas used to cost $2.04 per kilo before the combining of rates was permitted. Now, the same shipment can be sent via New York at a rate of $1.53 per kilo—a distinct saving to the shipper. ●

Edward Tarshinski owns 14 surplus warehouses—horns, navy blimps, even

. . . contamination-proof clothing, on display at recent surplus show.

Aircraft headsets become underwater earphones for divers, salvage men . . .

. . . nylon parachute cord earns money as shoelaces, rope, air cargo straps.

Surplus: Bargain Counter for the World Market

Usable but needed goods of U.S. government and industry are being sold world-wide by surplus dealers.

EVERY MORNING, an African fisherman awakes, slips into a pair of olive drab trousers and shirt, puts on a U.S. government tunic and paratroopers' jump boots. He then sets out for the seashore with his fishing tackle box—a converted ammunition can—tucked under his arm.

The fisherman, who resembles a foot soldier on field duty, is outfitted in an array of U.S. government surplus items which have found their way, through various marketing channels, to Africa.

These items are a small fraction of the $500-million worth of surplus merchandise from U.S. government and private industry sources now being sold throughout the world yearly.

• **Big business**—Today, there are approximately 20,000 surplus dealers in the United States who are buying a constant flow of excess or obsolete equipment from government and industry—at a fraction of original cost. About three-fourths of the merchandise is government surplus, which is sold to dealers through sealed bids, at auction. The estimated acquisition price, before the merchandise is declared surplus, ranges between $3,000-million and $5,000-million each year. And it is estimated that between 30% and 40% of all surplus is sold outside of the United States.

Africa has always been an excellent market for such products. Now it is becoming even more important as emerging countries, especially hungry for low-cost goods, find high quality surplus an excellent way to stretch their foreign exchange resources.

Other developing areas are buying surpluses. Latin America now consumes about 15% of U.S. exported surplus. And large quantities are shipped to Japan, Turkey, the Philippines, Italy.

• **Organization** — U.S. surplus dealers are well organized. Many belong to the Institute of Surplus Dealers, which annually puts on two trade shows in New York. The primary purpose is to help industry and government market goods which cannot be sold through normal channels.

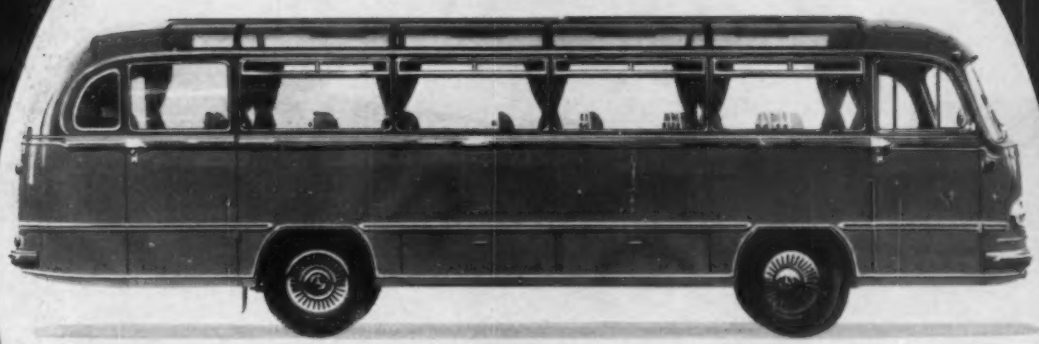
Last month, for example, several thousand purchasing agents, retailers, jobbers, U.S. exporters, and foreign importers descended on the Trade Show Building in New York to look at and buy some $12-million worth of surplus items such as army shovels, gas masks, marine cordage, survival suits, all types of clothing, tents, and insecticide bombs. End uses frequently differ from those originally intended: Filmmakers have bought crash helmets to outfit Martian spacemen; parachute cord became shoelaces; plumbers have bought mine detectors.

Next February, the Institute will display more than $100-million worth of goods, which will include electrical and plumbing supplies, electronic gear, hardware and tools, abrasives, machinery, sporting goods, office equipment, as well as military supplies.

• **Permanence**—Many have pondered the permanence of the surplus marketing business. They tend to think of it as a temporary phenomenon of the immediate postwar period; they suggest that as waste in government buying and over-production by industry is curbed, the surplus industry will diminish in importance.

But surplus dealers argue that obsolescence is as much responsible for the large quantities of unwanted surplus goods. The government (especially the military) must maintain large stocks, and must dispose of goods no longer suitable for its needs—but still usable. Similarly, in private industry, rapid changes in technology and consumer tastes should assure a steady flow of obsolete stocks of civilian merchandise into the surplus market. ●

The meaning
of quality
and experience



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A U.S. machine tool firm invades Europe with . . .

Direct-to-Customer Selling

DIRECT CUSTOMER CONTACT is the main marketing principle of the DoALL Company, a leading American machine tool manufacturer now beginning to sell its wares in Germany, Britain, and other parts of Europe.

While most of its competitors rarely if ever come in direct contact with the customer (they prefer selling through distributors), DoALL has built a highly successful customer-contact operation in the U.S.

DoALL is a privately-owned company, with a network of 37 U.S. and Canadian stores, plus its fledgling European operation. The company got its start by producing the band saw, a flexible, circular saw that cuts contours in anything from tool steel to bakery dough.

After World War II, DoALL added a line of grinders, and gage blocks. And it has taken on some of the characteristics of an industrial distributor by acting as sales agent for a number of noncompetitive but related items of industrial machinery and supplies.

• **Unique**—But varied as its operations might be, DoALL's success lies in its unique marketing system. This direct-to-the-customer selling technique was developed by DoALL's president, Leighton A. Wilkie. While he hopes his direct selling technique will have the same success in Europe as it had in the U.S. and Canada, he does concede that he may have to alter the company's sales methods slightly to conform to European custom.

Basically, here is how the DoALL marketing system works, as reported in McGraw-Hill's *Business Week:*

• While its competitors reach most of their customers through independent distributors, DoALL sells exclusively through its own stores.

• In an industry where the principal association permits only one trade show every five years, DoALL pours money into promotion and fanfare.

• While competing manufacturers rarely meet the final users of their products, DoALL dispatches demonstrator units, with machine tools mounted on trucks and trailers, right out to potential customers' plants.

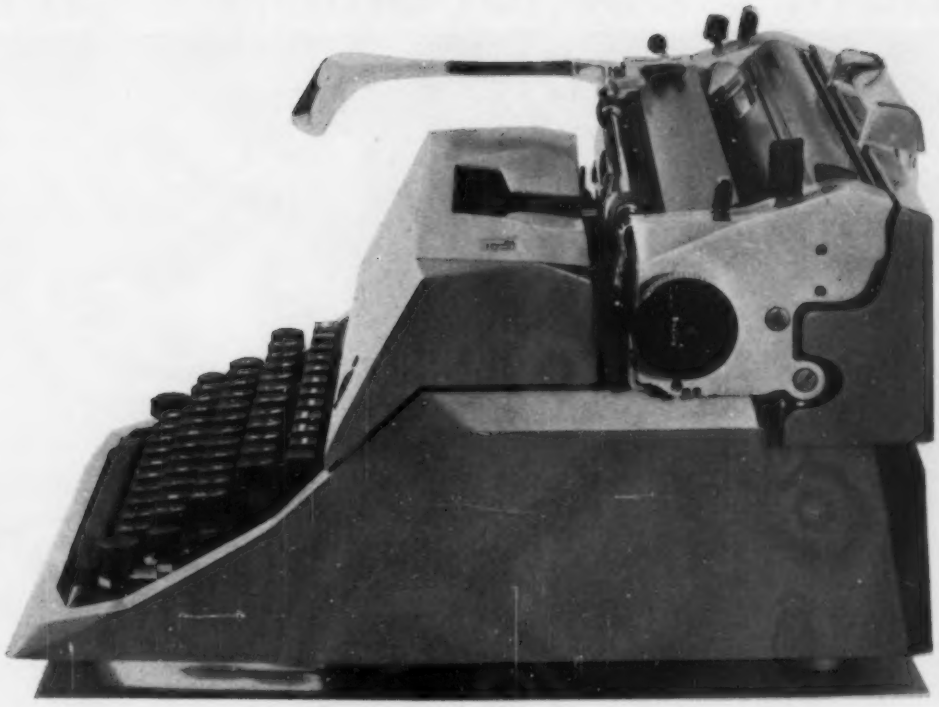
• Yet, for all its marketing orientation, DoALL reveals its machinery background in insisting that selling and salesmen can be standardized just as fully as production and factory workers.

• **Competitive**—If the DoALL technique affects industry in Europe as it has in the United States, traders there are in for quite a battle. Only 30 years old, the company says its sales average between $30-million to $35-million annually—which would rank it fifth or sixth in an American industry where total sales fluctuate widely within a range of $450-million to $750-million per year. It also claims to maintain a profit margin at least as good as any in the industry.

DoALL's aggressive search for customers takes many paths. Each store is its own publicity agent. In an industry where most selling is done out of a catalogue, DoALL impresses its customers by dressing its store fronts in gleaming letters which spell "DoALL" in stainless steel, cut by one of the company's saws. Almost the entire front half of the store consists of a demonstration floor where DoALL machines are shown.

DoALL's trailer-selling operations are a typical innovation of Leighton Wilkie. Cars pull trailers mounted with DoALL equipment. The salesmen drive to the prospective customer's plant. If the prospect is willing, the salesman gives him a demonstration on the premises, and the machine is right there if he decides to buy.

• **Repeat Orders**—But normal machinery sales alone is not what DoALL is after. The real goal is to establish a franchise and, more important, to supply customers' replacement parts. Because machine tools use up five times their original value during an average lifetime, the replacement business carries a high profit potential. ●



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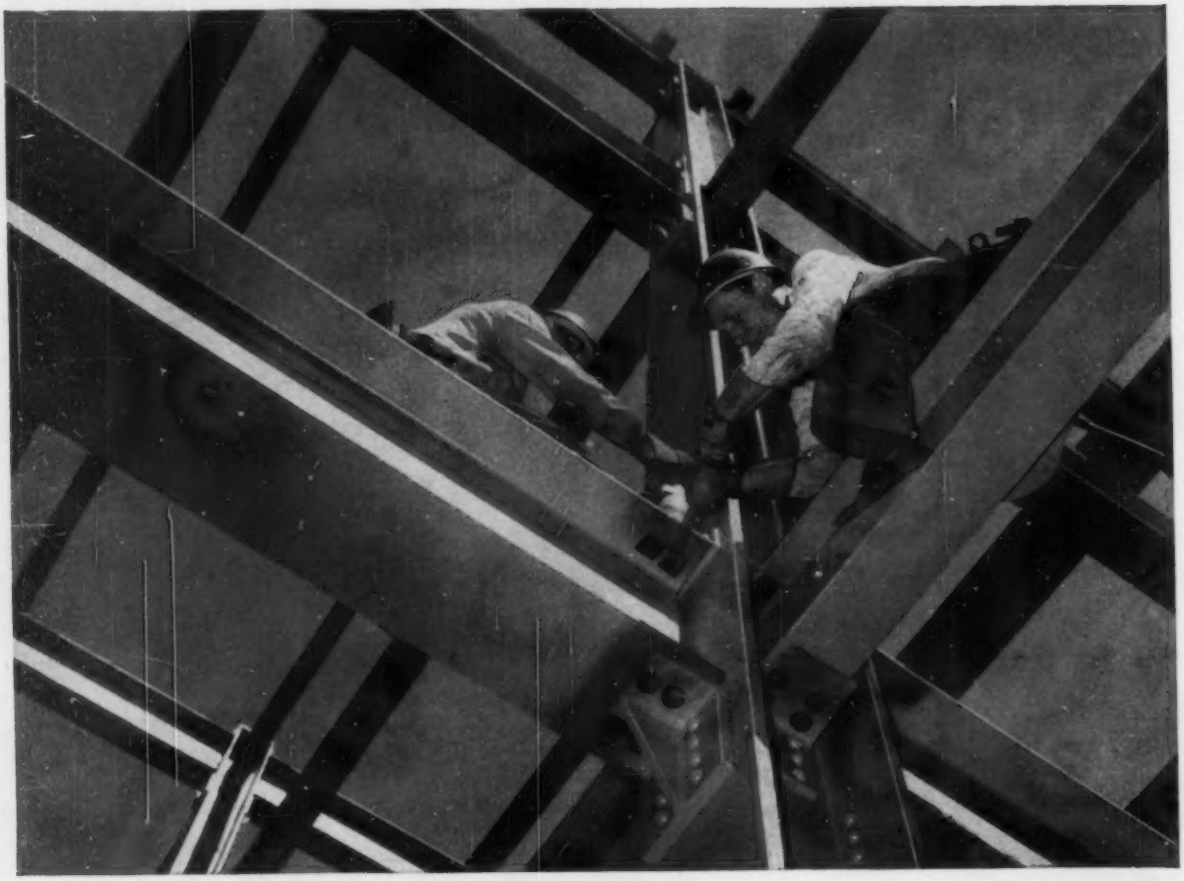

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Finding a Home for Idle Patents

A New York firm now is moving out into the world—even to the U.S.S.R.—in its business of matching inventions with buyers, and vice versa.

A FEW WEEKS AGO six Americans returned from Moscow with contracts to sub-license a number of Soviet developments in electronics, machine tools, and medical instruments. They had visited the U.S.S.R. representing National Patent Development Corp., a company in the fast-growing business of bringing together patents and people who might exploit them.

The Soviet "patents" are a tentative, as yet experimental, business deal (IM—Aug). But National Patent has high hopes for success. In its two years of doing business, the company has found eager interest in unknown and unused technology—be it European, Japanese, Soviet, or North American.

• **Hidden Treasure** — Consider the opportunity in the U.S.A. One by-product of this nation's huge program of industrial research—amounting to some $12,500-million a year—is that many products and processes with great value never get to the marketplace. Many find an unmarked grave in the patent vault of a company with no interest in the invention.

For example, researchers at an electronics laboratory may accidentally stumble across a better adhesive. What do they do about it? Normally, they file a patent application. And then, more often than not—because the item is not in the mainstream of their interests—they put the patent aside and forget about it.

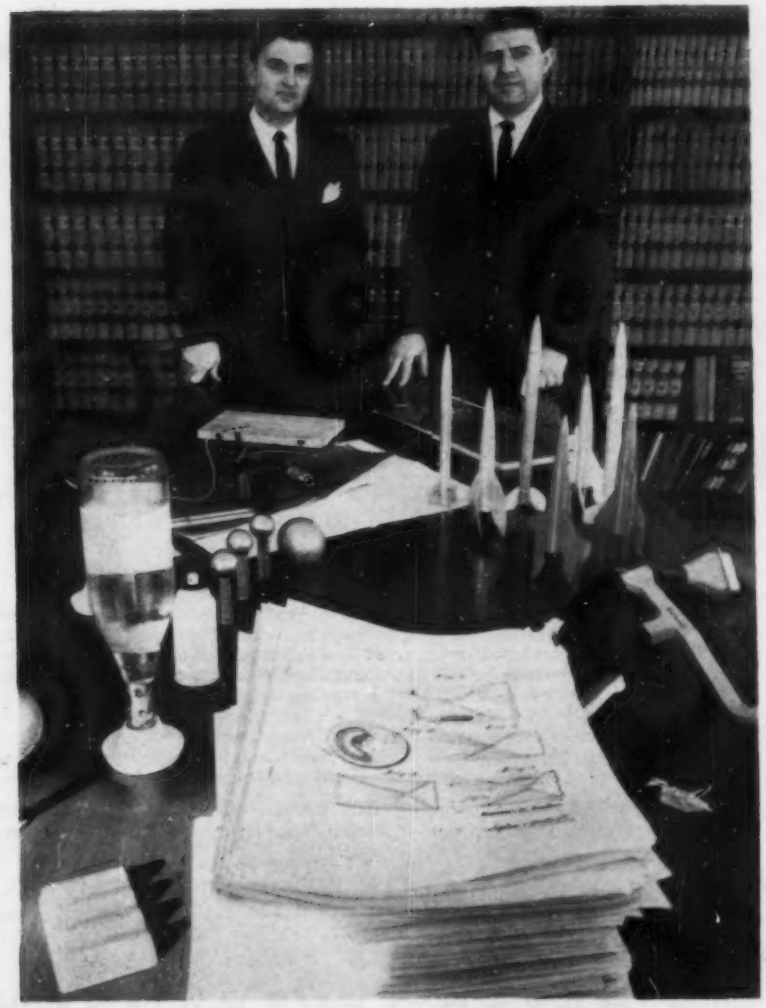
How common this is became clear some months ago from a survey conducted by Jerome Feldman and Martin Pollak, the two lawyers who are president and vice-president respectively of National Patent Development Corp.

Of the 106 leading U.S. corporations answering National Patent's questionnaire, 43% said they had patented discoveries in the past five years that were not directly related to their businesses. About 80% of these patents were not being used. Furthermore, 93% of the companies indicated they would welcome an opportunity to license their unused patents; and 57% said they would be interested in the idle patents of other companies.

• **Opportunities** — The survey confirmed what Feldman and Pollak had suspected in setting up National Patent two years ago, and started them on a whirlwind of activity concerned with products like those pictured at left.

Displayed before the two lawyers, front to rear, are: a bottle-cap that when turned upside down forms a stand and air-seals the gases of the champagne or soda; an aerosol can with a top that can be rotated to adjust the density of its spray; metal spheres and rockets that illustrate an innovation in rocket flight; a "talking book" whose pages have text on one side and magnetic tape on the other.

Of course many lawyers specialize in helping inventors find a



FELDMAN (right) and Pollak stand before several promising inventions.

Bayer buyers know:

With the current rate of increase of the world population by about 48 millions every year we shall be passing the three thousand million figure by 1962. Hence fibres from natural sources are since long unable to cope with all our requirements in the field of clothing. One-fifth of the world demand for textile fibres is already being met by man-made fibres. Bayer fibres such as Perlon® and Dralon® – the synthetic spun fibre which is being processed in Europe to a larger extent than any other synthetic fibre – have their share in meeting the great demand. At the same time, their appearance on the market has ushered in an era of appreciation of their unique and novel textile properties.

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The Hallmark of Reliability

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market for their patents. And other specialists, including a number of independent research groups, make a business out of finding new products and ideas for companies. Several U.S. companies maintain scientific "listening posts" in London, Zurich, and elsewhere.

National Patent not only hunts for inventions and attempts to sell others, but it operates in a special way. For example, the firm accepts no retainer from an inventor looking for a place for his product. This is the common practice with patent brokers: For a fee of $100 or more they will look at your patent and see if they can find anyone who is interested in it.

National Patent experts are ready to talk to anyone with a patented invention. If the item looks promising, National Patent itself will gamble on it.

• **Close Study**—First the corporation's consulting board of lawyers, scientists, and engineers studies the invention. The item is thoroughly evaluated as to its technical feasibility, its marketability, its potential profits.

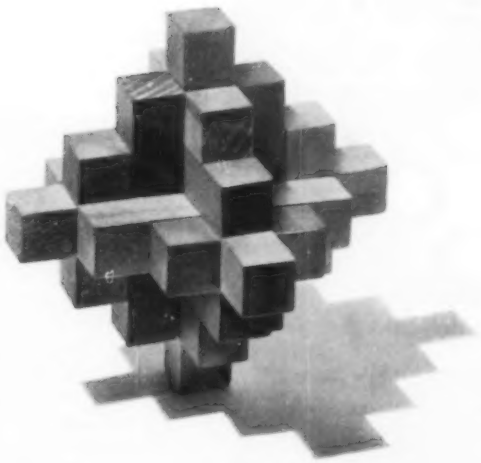
Though they may be aimed at a real consumer need, many products are impractical to mass-produce. Or they may be impossible to make at a price competitive with similar-purpose items now available. Still other products—though technically feasible—have an uncertain or economically unsatisfactory market.

If the patented invention stands up under all these conditions, National Patent goes looking for someone who can exploit it. The firm may even find third-party financing.

It normally does all of this without any fee from the inventor. But it is rewarded, if and when the product succeeds, by a sizable commission.

When it is operating the other half of its business, acting as a new-product scout, the firm accepts a retainer. National Patent often serves big companies in both ways at the same time under contract. It can keep an eye out for new ideas for a company and at the same time screen the client's own dormant patents.

• **Foreign Effort**—On the strength of their domestic success,



Profits a puzzle?

In seeking a solution to the profit puzzle, more and more businessmen are turning to Japan. Many are becoming aware of how profitable it is to trade in this country that offers a growing variety of quality products finding ready markets.

Many of these products are manufactured by companies in light and heavy industry that carry the Three Diamonds mark. These are Mitsubishi companies, all represented in foreign trade by their big general-trading partner, Mitsubishi Shoji.

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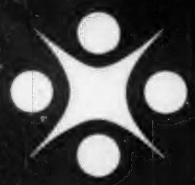

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Feldman and Pollak now are taking steps overseas. They have set up contacts in London, Milan, Frankfurt, and they recently sent a second survey to U.S. companies, asking these questions: Are you using foreign patents? Are you interested in doing so? Are you licensing your own patents abroad? Under what conditions and control?

A lawyer's mind obviously was behind these questions, answers to which now are beginning to come back. Feldman and his associates are aware of the promising research being done in Europe, Japan, and elsewhere. And they know that some of the products of this research may be too sophisticated for the local pocketbook, but might find a more eager market in the U.S.

On the other hand, U.S. laboratories are coming forward with items not readily marketable at home. But some of them may be of use elsewhere. For example, a small generator powered by wind or sun may have little appeal to an American farmer whose property is bordered by a high-voltage power line. But the same item may bring electricity for the first time to a farm in Paraguay or India.

• **On to Russia**—National Patent now has gone a step further in its overseas operations. Feldman and five associates recently spent three weeks in Moscow, in an effort to work out a system of cross-licensing between the Soviets and U.S. companies. They ended up in partial success: contractual rights to 50 to 70 Soviet technical developments.

If National Patent can find exploiters for even half of these patents, Feldman says, up to $100-million annually in license fees may be involved—more than the total U.S.-Soviet trade today.

National Patent hopes that this contract will pave the way for selling U.S. patented techniques to the Soviet Union—much of which the Communists now take without charge. He believes that when Soviet officials begin getting revenue on their licenses they will be more inclined to honor world patent practices and pay for foreign technology.

Soviet officials have indicated they may be getting ready for such a move. Deputy Premier Alexei Kosygin not long ago told a conference of his scientists that there may be substantial savings in time and energy in buying certain Western inventions.

But the U.S. government would first have to relax its ban on the transfer of certain strategic information. Feldman hopes it will. In the meantime, he will be busy licensing Soviet developments, finding and exploiting new inventions, and, in the words of one of his associates, insuring that "more fruits of science and invention are made available to the public."

To Patent or Not to Patent

Not all inventions can and should be patented, writes attorney Hugo Wikstrom in *Product Engineering*. "If the returns will be short-term and development expenses low, such as with hula hoops, you ordinarily needn't bother with a patent."

Wikstrom cautions inventors against waiting until a product is almost ready to market before seeking a patent. By starting patent procedures early, he says, an inventor gets these advantages:

(1) A pre-patent objective study of his invention's worth.

(2) Valuable knowledge about similar inventions that for some reason never were marketed, and about the divergent paths that other inventors took in attempting to solve the same problem.

(3) Understanding of the amount of protection that will be needed—so that a patent can be custom-tailored to the invention.

Patents are now classified in over 50,000 sub-classes. A strong patent takes a lot of searching, writes Wikstrom. Also, "careful early evaluation will save money by limiting the extensive search to the few occasions when it is really needed."

For a 48-page *Review of Patent Problems*, including international patent regulations, send your request with $1.50 to Reader Service Dept., Product Engineering, 330 W. 42nd St., New York 36, N.Y., U.S.A.

Turn to page 35 for more TECHNOLOGY

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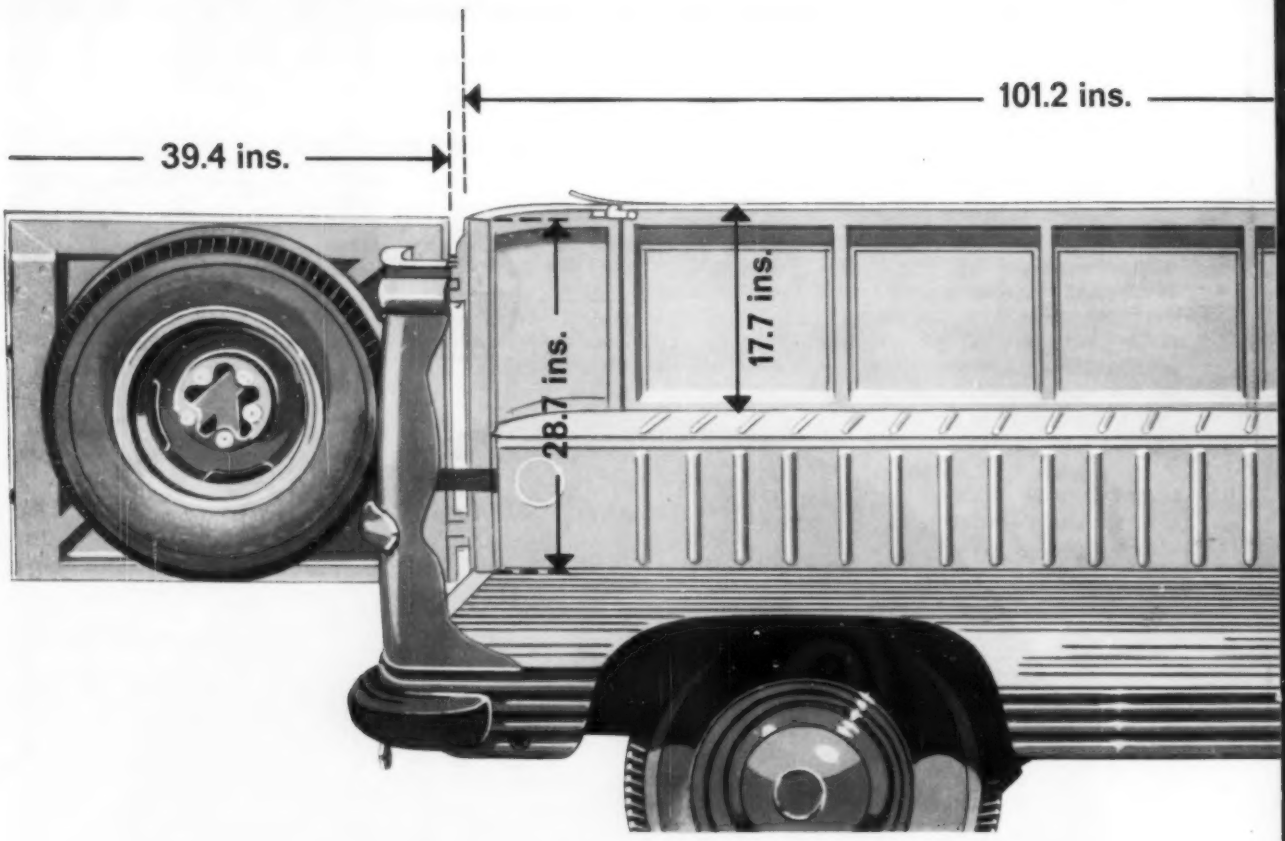

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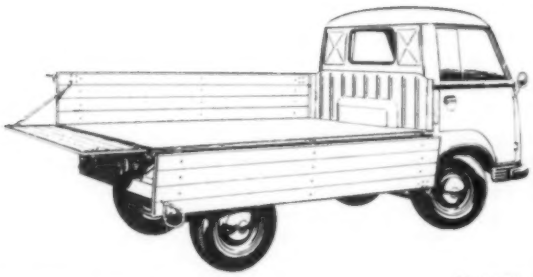
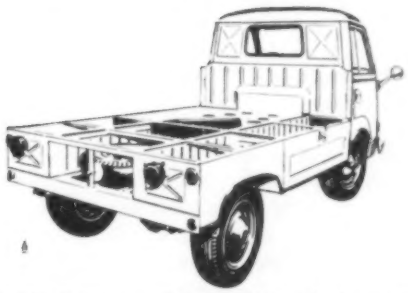
Transit 1000	43 HP (SAE)	4630 lbs.	2205 lbs.	59 mph	32.5 miles/Imp. gal.
Transit 1000	60 HP (SAE)	4740 lbs.	2205 lbs.	62 mph	31.4 miles/Imp. gal.
Transit 1250	60 HP (SAE)	5291 lbs.	2756 lbs.	62 mph	30.7 miles/Imp. gal.

These specifications may vary from country to country

at load area · all steel body





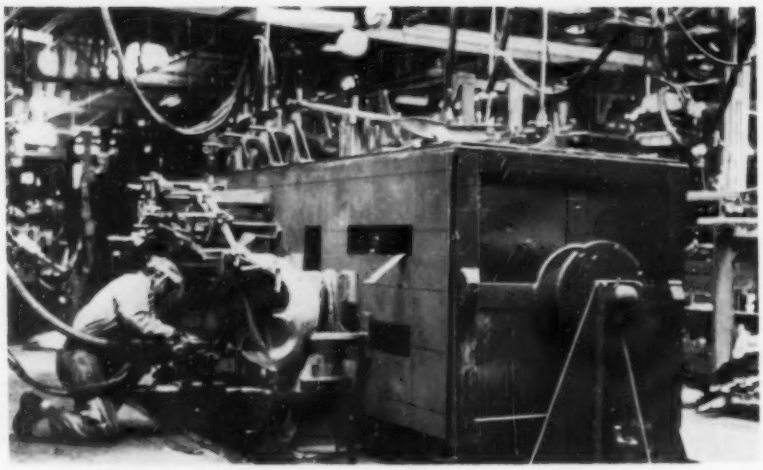
A complete line of quality commercial vehicles

Chassis/Cab wooden platform: Large and level load area of 5.6 x 8.5 ft. High payload for maximum profit: Either 2756 or 2205 lbs. Available also with frame or canvas covering.

Chassis/Cab: Basic models for a wide range of locally manufactured bodies. Strong all steel single unit construction for exceptional durability. Sturdy truck type springs and axles.

TAUNUS TRANSIT

from FORD of Germany



FLIP-OVER JIG tools for a different model car on each of its four sides.

Mexico Exports Tooling Ideas

AUTOMAKERS who build cars abroad have one problem that stands out above all others: How do you efficiently tool for assembling a few thousand cars a year of various models?

Permanent jigs—for holding the subassemblies in place—just are not practical for each model. On one day you may be putting out 5 or 10 cars of one kind; on the next day, a dozen cars of another kind.

• **Changeable Jigs**—Mexican ingenuity now has come forward with a major step in solving the problem: jigs and other tooling that can be quickly changed from model to model. The flip-over jig shown above is an example. It and similar devices are largely the inventions of two supervisors at Ford Motor Co.'s subsidiary in Mexico, technical manager Sebastian Aguinada and tooling chief Miguel Rojas.

Ford-Mexico has been turning out this type of tooling for itself for some time. Now it is producing similar equipment for other Ford plants—in Rhodesia, Singapore, Turkey, Egypt, New Zealand, Argentina, and Chile.

"Ford technicians have invented something that big-plant engineers never would have thought of," says one observer close to Ford-Mexico's operation. "This is because big-plant engineers don't have to live with the problems of low-volume, hand-to-mouth production the way the Mexicans do."

• **Nine Models** — Ford-Mexico builds about 10,000 vehicles a year, from parts furnished by U. S., West German, and British plants. Nine different models are turned out at the Mexican plant, a fact that has made permanent inflexible tooling highly uneconomical.

Aguinada and Rojas first designed the flip-over jig. In essence, it is a rotating box with jigs for different models on each of four sides. When the assembly has to change from one model to another, the operator merely flips the jig over and begins taking new body pieces. The jig is color-coded for matching the parts with the right jig clamps.

Once a piece is welded it goes to a body buck (final-assembly platform), which also has color-coded clamps. Unlike standard tooling, clamps on the buck can be pushed out of the way to suit each model.

• **Savings**—By making similar tool systems in Mexico for other areas, Ford is saving 40% over estimated U. S. costs. In Rhodesia, for example, an entire plant is being built under Ford-Mexico supervision, and almost all the equipment is coming from Mexico in a package deal.

Ford-Mexico may have broader outlet for its jigs. Some engineers believe that even high volume plants in the U. S. and Europe could adopt some of the Mexican contrivances—to produce, for example, window assemblies for a wide range of models. (*Business Week, July 22, p48*)

Sonic Spraying

. . . promises better quality, lower costs for chemical and food industries

INDUSTRY'S two major spraying problems—particle size and spray-nozzle wear—may be close to solution. A new spray nozzle, made by Astrosonics Inc. of the U.S.A., solves the problems by bombarding a liquid stream with sound waves.

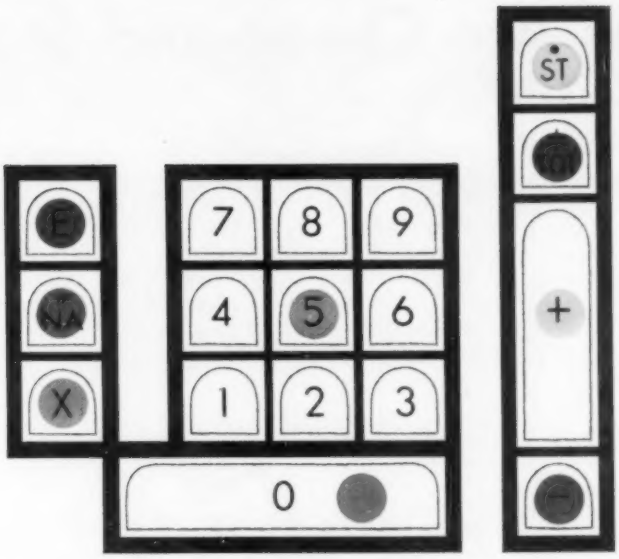
The first commercial application of the equipment will be in equipment-parts cleaning. But *Chemical Week* says that the opportunities for the new technique are broad—for such tasks as drying, humidification, cooling and wetting now done by conventional spray systems. And spray-drying alone, for the chemical and food processing industries, represents a multi-million dollar business for equipment makers throughout the world.

• **Wear Problem**—In the conventional spray system, detergent makers—one of the largest producers of spray-dried products—often find that nozzles wear out in a few weeks. Replacements cost $100 each.

The Astrosonics nozzle is expensive, selling for $395, but the price should come down with greater volume, and the equipment will have a long life. The liquid to be sprayed often can be fed by gravity or low pressure, since the sound waves cause the atomization. Even when higher pressures are used, the nozzles are expected to last: Only a 100% increase in the size of the hole, says the manufacturer, would cause a significant change in particle size.

• **Uniform particles**—Almost all spray-product makers are concerned about the uniformity of particle size. This is the key to standardizing the characteristics and performance of their product.

In ordinary spraying, the liquid is drawn out into thin streams or filaments which are easily deformed, even by minor outside forces. The new method gives a more uniform droplet size, says an Astrosonics researcher, by striking the liquid with high-frequency sound waves that make a clean cut of the liquid stream. ●



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The smartly styled J400 Ten Key in blue

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Burroughs

Dies That Are Cheap and Sturdy

Savings come from coating a base metal with a tough alloy.

"COMPOSITE DIES" are finding increasing favor in U.S. machine shops. They use a relatively inexpensive metal for the bulk of the part, then cover this with a harder alloy.

Dies made in this fashion often outlast standard dies, according to a recent report in *Purchasing Week*. And they have other advantages: They are easier to make, they do not require as much expensive material, and they are simpler to rework than single-metal pieces. If redesign is needed, shapes often can be added to the standard die, then covered with the alloy and machine-finished.

Composite die-making involves four considerations, according to Joseph Quaas, technical director at U.S.A.'s Eutectic Welding Alloys. They are: selection of the base metal; selection of the coating alloy; a process for joining them; machining of the base metal and then the finished die.

The Parent Metal: Selection of the parent material for a composite die is governed by the end use requirements. A simple mild steel will make a reliable base in most cases. If a tougher parent material is required, a low alloy steel is recommended.

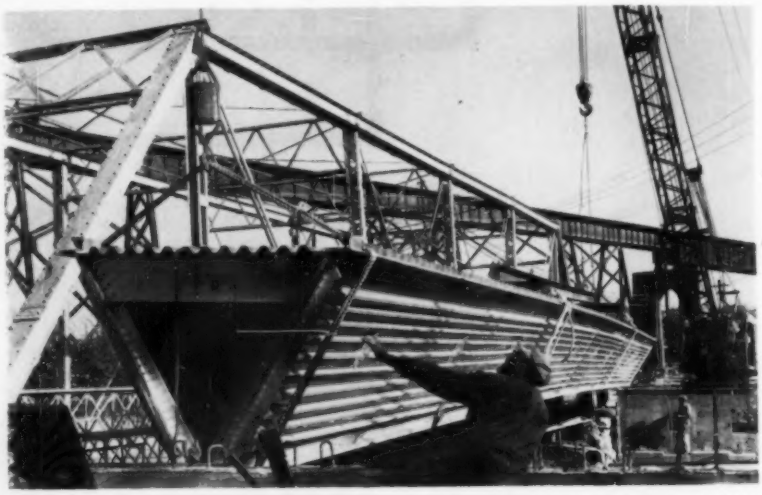
The Coating Alloy: Selection of the "filler" or coating alloy will be guided by the die's need for abrasion resistance, toughness, size stability, machinability, and red hardness. The filler is especially important, because it determines the life of the die.

Joining Them: At least three welding processes are available for joining the filler to the parent metal. Oxy-acetylene, found in most shops, subjects a hand-fed filler to a mass of hot gasses. Two sophisticated systems are metallic arc and atomic hydrogen.

Metallic arc processes are the most versatile. A coated electrode is held in a holder, and an arc is maintained by an ionized gas stream that materializes from the flux coating. A wide range of materials can be used. A stainless steel type alloy, for example, can be deposited by using a mild steel core wire surrounded by a coating of chromium and nickel.

Atomic hydrogen welding draws an arc between two tungsten electrodes when an alternating current flows through the circuit. A stream of molecular hydrogen gas surrounds the arc area, then releases absorbed heat as it moves away from the arc. The process permits fast deposition, and is recommended for thin sections.

Machining: The parent material first is machined at least 3 millimeters to make room for the filler. Then the final composite die is machined. Annealing may be necessary if intricate working is called for. Machining may be done with the same speed used on the filler alloy by itself. ●



BRIDGE of triangular aluminum girders will replace truss structure at left.

Light Metal Builds a Bridge

CONSTRUCTION MEN appear to be learning a few tricks from aircraft builders. The evidence is above: triangular girders made of aluminum extrusions and sheet, which form the structural floor of a 30-meter bridge crossing the Appomattox River in Virginia, U.S.A., and opened to traffic last month. Three other aluminum-sheet bridges are going up in the U.S., one a 90-meter span.

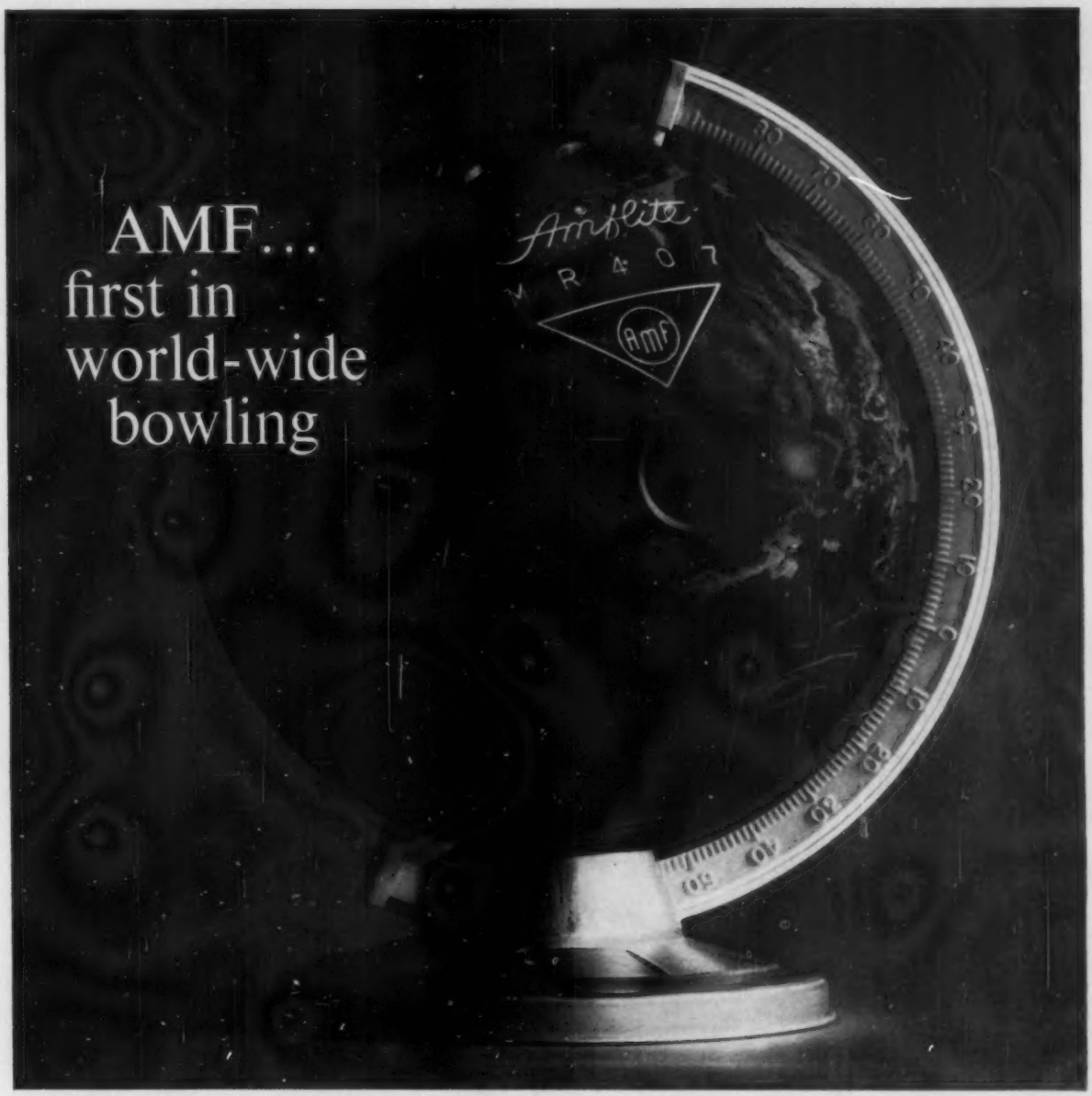
The five girders used in the Virginia bridge were designed like the body and wings of an airplane, reports *Engineering News-Record*. The thin aluminum sheet making up the side is as essential to the girders' strength as the extrusions that form the framework.

• **Standard Metal** — Aluminum for the bridge came off the standard production lines of Reynolds Metals Co. About 65% of the metal is in the form of extrusions, the remainder of 2.5-millimeter sheet. All of it is 6061-T6 alloy.

The triangular girders are about a meter and a half high, and two meters wide at the top. The tops are of corrugated sheet, which serves as support for the concrete deck.

• **Simplicity**—Erection consisted simply of placing the girders side by side, apexes downward, on prepared abutments. A crane lifted each 30-meter member directly from the truck to its final position on the abutments. The contractor then bolted the girder edges together at the top and connected the apexes with channel bolts at three-meter intervals.

The entire aluminum bridge weighs less than 22 tons, compared to the 85 tons it might weigh if it were built of steel. And the Virginia bridge is costing 5% to 6% less than a steel structure. ●



Over 80,000 AMF Automatic Pinspotters around the world: AMF has gone world-wide with the machine that revolutionized bowling. Ever since the first fully automated lanes were opened in September, 1951, at the Bowlodrome, Mount Clemens, Michigan, U.S.A., the AMF success story has been repeated on every continent. Over 80,000 AMF Automatic Pinspotters have been installed or contracted for world-wide, and the rapidly-growing international market accounts for over 4,000 of these, with a backlog of orders worth more than $24,000,000.00.

The AMF Automatic Pinspotter record: AMF's impressive list of "firsts" include: U.S.A., September 15, 1951; Canada, August 26, 1957; Puerto Rico, March 29, 1959; Sweden, June 22, 1959; Mexico, November 15, 1959; Venezuela, December 15, 1959; United Kingdom, January 20, 1960; Panama Canal Zone, February 26, 1960; Bahamas, March 10, 1960; Monaco, June 13, 1960; Belgium, August 13, 1960; France, August 29, 1960; Australia, October 14, 1960; Switzerland, October 18, 1960; Bermuda, January 5, 1961; Italy, March 15, 1961; Japan, June 15, 1961; and the Netherlands, June 27, 1961. Wherever Pinspotters and other AMF bowling equipment are in operation, AMF provides sales and service personnel.

AMF Automatic Pinspotters are now installed in over 95% of all overseas U.S. Armed Forces establishments with automatic bowling lanes. One large order equipped *all* of the 160 Army bowling centers in Europe.

AMF Pinspotter assembly overseas has already begun in new AMF plants in England and Australia. AMF also produces overseas, the full AMF line of top quality equipment including bowling lanes, Magic Circle*, Underlane® ball returns, pins, balls and accessories.

AMF International's 40 years of experience in overseas markets: A long history of successful export sales and overseas operations in machinery and other products has enabled AMF to achieve record progress and continuing leadership in the current world-wide expansion of the bowling industry. AMF now has 14 plants overseas producing tobacco and bakery machinery, water treating equipment, nuclear and electrical products, and a wide range of recreation goods.

Let us have the opportunity to show you how an AMF equipped bowling center can be a sound investment for you.

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Progress in Electrostatic Copying

OFFICE-MACHINE makers are jockeying for position in the new and rapidly-expanding electrostatic office copying machine market. Xerox Corporation produced the first automated electrostatic copier for office use, the large Xerox 914, about 20 months ago (picture, below); now Smith-Corona Marchant, Inc. has a desk-top model scheduled for

Xerox Corp.'s 914 copier

introduction early in 1962 (picture, right)—the fourth electrostatic machine to be announced in the past eight months.

Many believe electrostatic units promise to come closest to the ideal copying machine. They reproduce all colors (in black) in a dry, one-step process, making copies that are sharp and of high quality.

• **How it Works**—Basically, electrostatic copying involves a process of charging, exposure, development, and fixing. The zinc-coated surface of the copy paper is coated with an electrostatic charge that attracts the black powder ink used to make the copy. The paper is then exposed to the original document. Light bouncing off the original will cancel out the charge on the copy paper anywhere the original is blank.

The black ink powder is then dusted over the entire copy sheet, but it sticks only to the still-charged portions, thus forming an accurate duplicate of the original document. The powder image is then heated to fuse the powder to the paper.

Until recently, the only model available using the electrostatic principle was the Xerox 914 copier —a sophisticated, desk-size unit that rents for $95 a month. Now American Photocopy Equipment Co. (APECO) has come out with a smaller, desk-top machine. Two other companies, BBM Photoproducts Mfg. Co. and Savin Business Machine Corp., will go into production late this year, Smith-Corona Marchant early next. Meanwhile Xerox Corp. is working on a smaller companion to its 914 copier.

Here is a review of existing and proposed models:

• **Xerox Corp. 914 Copier:** Desk-size unit rents for $95 a month, not available for purchase. Copies on ordinary unsensitized paper. Automatic operation permits use on short runs. Has dial selector for number of copies desired.

• **APECO Electrostat:** Desk-top unit is being leased at $53.50 per month on three-year basis. Uses special white paper. Maximum copy size 27.5 cm by any length.

• **BBM:** Volume production of desk-top machine expected in November. Machine will sell for $500-

Smith-Corona's Model 33

$600, uses roll of special paper inside unit. Maximum copy size 21.25 cm by any length.

• **Savin:** Unit will be sold early next year at $650 for semiautomatic operation, $750 automatic. Company claims machine will work on any type of paper. Maximum copy size 21.25 × 27.5 cm.

• **Smith-Corona Marchant:** Model 33 is scheduled for production early 1962. Machine will sell for $895, also be available for lease. Uses special paper (stored inside unit). Maximum copy size 27.5 cm by any length.

No matches?

A "superior" kind of self-lighting cigarette will come shortly from Continental Tobacco Co., Inc., in the U. S. The smoker draws the cigarette's coated end across an abrasive surface on the package. The coating, patented substance, is odorless and tasteless and glows when ignited.

"Spinning" contact lenses

A contact lens maker claims to have solved a knotty problem: how to get tears and oxygen under a contact lens and to the cornea of the eye where they are needed for lubrication. The Contact Lens Guild, Inc., of Rochester, N. Y., U.S.A., has designed a contact lens with spiral-shaped channels on the side that touches the eye. The normal flow of tears makes the lens "spin" like a water wheel. In this way, all parts of the eye are lubricated by the normal flow of tears, thus increasing comfort and keeping the eye healthy.

Glass solders aid design

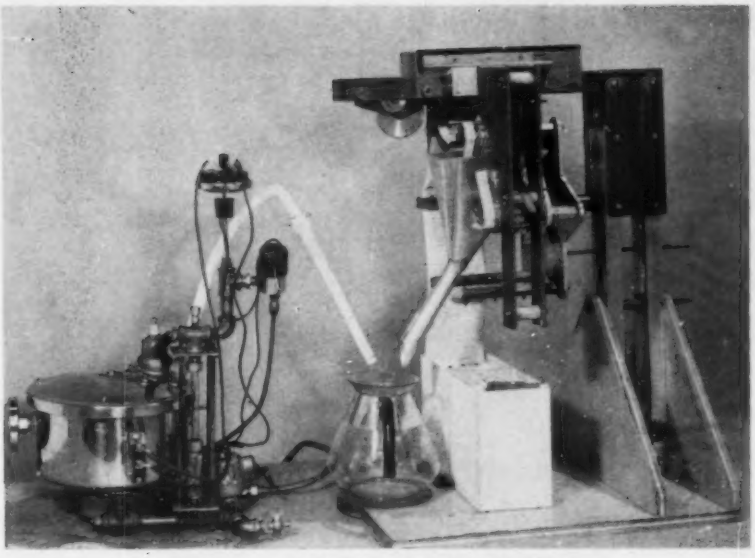
Several U. S. companies are working on devitrifiable-solder glasses and cements which, they say, promise new designs in vacuum devices, electron tubes, and other glass equipment. These solder glasses are finely divided frits which, under heat, melt, flow, and cure into glass-bonded ceramic bodies. General Telephone Labs., Sylvania Electric Products, and Westinghouse Electric Corp. are in the forefront of the research.

Smallest TV camera?

Latest entry in the miniature industrial television field is a tiny camera, 7.5 cm in diameter and 22.5 cm long, made by E.M.I. Electronics, Ltd. of Britain. An important achievement is the camera's video system, which gives 650-line resolution as against the average 300-line resolution of normal radio-frequency systems. This means the camera gives a sharper picture and can operate with as little as 10 luxes.

Multi-purpose robot

U. S. Industries, Inc. has what it terms the "first general-purpose automation machine," in contrast to previous robots which have been custom-made. Called TransfeRobot, the device consists of an arm and actuator that can be fitted with many types of fingers and jaws, all controlled by a self-contained electronic brain. A typewriter manufacturer is using the robot for picking up, transferring, and placing a small component into a close-fitting nest for an automatic machining operation.



Now: automatic "instant" coffee

Designed to fill a need in the U. S. food industry, this machine makes coffee automatically from the popular "instant" soluble coffee. A working prototype of the machine is shown above. The water boiler is at left. On the right is a mechanism for feeding, opening, and emptying packages of powdered coffee into the decanter. The machine makes up to 300 cups of coffee (38 liters) an hour; it may be set to pour varying amounts of water to the carafe, depending on how customers prefer their coffee. Gen. Foods Corp., the manufacturer, claims the process cuts direct labor time by two-thirds.

Solar electric plant

Israeli scientists have built a plant that converts solar energy into electricity. The plant uses chlorobenzene vapor and has heat accumulators to insure a supply of energy during the night. Cost is put at 5 cents per kilowatt-hour, provided the climate is sunny.

Portable water supply

A U. S. company, Astro Dynamics, Inc., of Burlington, Mass., has announced a self-contained, portable water supply for use in maintaining optimum operating temperature of critical equipment. It will hold the temperature of the water supplies to ±1°F, and supplies up to 1 kw of heat —or cools up to 1½ kw. The manufacturers foresee its use with a wide range of equipment—communicat ons and radar, control, medical, plastics, textiles, and chemicals.

Machining a fine seam

From Metalmeccanica of Milan comes a high-speed embroidery machine, claimed to be up to 50% more productive than conventional models, and 30% faster than the speediest machines hitherto available.

Scrub-proof polished floors

Simoniz Co. of Chicago is about to market a radically different kind of liquid floor polish. To be introduced first as an industrial then a consumer product, the polish gives a shine that resists repeated scrubbings with soaps or detergents, mainly because it is based on acid-soluble polymers. The polish can be removed with an acid remover which the company will include in the polish package.

Fuel cell from Japan

Matsushita Electric Ind. Co. of Osaka is putting into commercial production a low-temperature fuel cell of the carbon electrode type. It will consist of 10 cells (1 volt, 3 amp) and weigh about 5 kg. Thermal efficiency is said to be 70%. Hydrogen gas is the fuel, air is the oxidant, and caustic soda is the electrolyte.

Telephone aids medicine

A doctor will be able to study a patient's heart beat from thousands of miles away with a service called Data-Phone developed by Bell Telephone Systems of the U. S. The electrocardiograph is transmitted by telephone directly from the patient's heart to remote recording instruments. The company hopes soon to extend the service to X-rays.

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No Boards • No Front Rod • No Back Rod • Air or Steam Piston-Lift, Gravity Drop • Costs Less to Operate • Forges more minutes per hour • Safer and easier to operate • This hammer is setting new records in cutting costs and increasing production, in forge shops all over the world.

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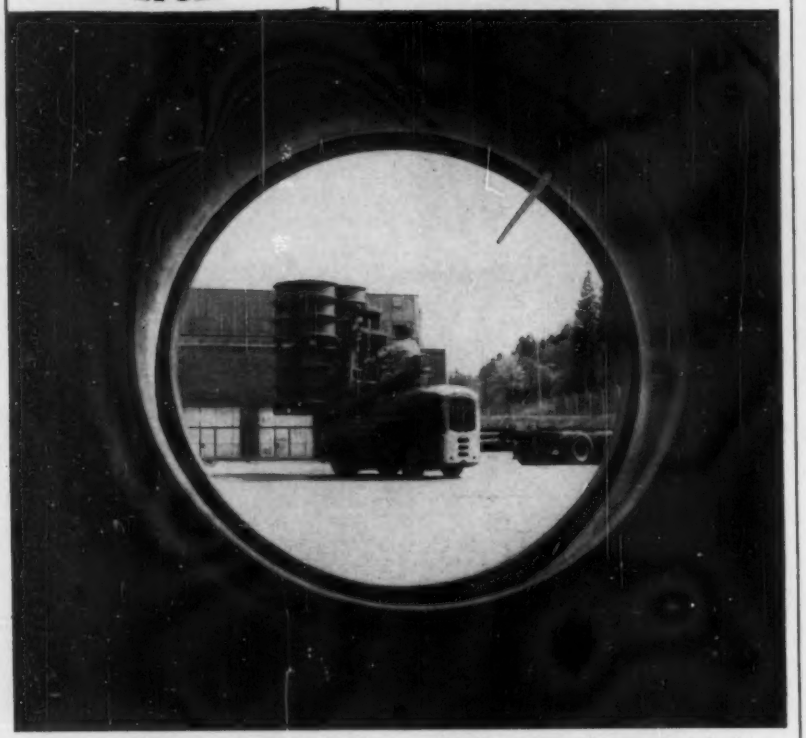
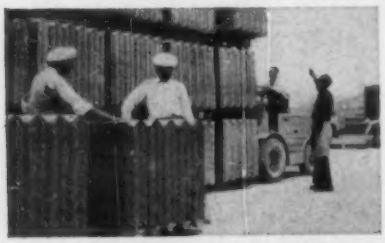


STOCKHOLM, Sweden – A double-decked load of palletised wheel rims for the manufacture of highway trucks moves swiftly by Yale petrol fork-lift truck from outdoor storage at the Scania Vabis factory. Yale industrial lift trucks to fit the most difficult or exacting materials handling requirement are available in capacities up to 200,000 lbs. Find out how Yale trucks can reduce your handling costs from your nearest Yale sales and service representative. Or write Yale & Towne direct.



CASABLANCA, Morocco – A Yale petrol truck, capacity 8000 lbs., works tirelessly moving, lifting and stacking heat-reflecting corrugated cement roofing materials at the Dimatit Works. Whether in warm desert sands or in the cold, frozen north, Yale industrial lift trucks speed the movement of goods, reduce handling costs to a minimum.

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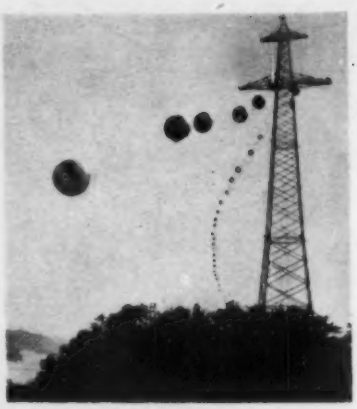

"Operation balloons"

Seventy-odd gay balloons carried a wire across the 1,700-meter channel of Naruto, in Japan, some weeks ago in what is believed to be an unprecedented wiring operation to connect two transmission towers separated by treacherous waters. The balloons were tied one by one to a 9-mm messenger wire pulled across by a tugboat. The wire is to be replaced gradually by bigger lines.

Giant plastic hulls

Plastics are taking to the water in a big way with the completion of two 20-meter-long yachts, each of which has a one-piece seamless hull of fiberglass-reinforced plastics. John G. Alden & Co. of Boston, the designers of the so-called Halmatic 67 yachts, used a patented, low-cost method of molding the integral framing: Strips of aluminum were bent into a U-shape, then curved to fit against the inside of the hull. The first boat weighs about 6,500 kg, the second roughly 5,175 kg.

Transistorized gramophone

A gramophone with a transistor battery, in a suitcase of polysterene, is the latest from Philips of the Netherlands. The turning disc is mounted on a nylon ball-bearing and has a built-in 45-rotations adaptor. The engine is automatically switched off after the record is played. Philips says the gramophone can play all records up to 30 cm in diameter, at speeds of 16, 33, 45, and 78 rpm.

Heat storage block

To take advantage of lower power rates at night, the Witte Heiztechnik GmbH of Iserlohn, West Germany, has perfected a thermal storage block. Heat stored in the unit is carried away by an air stream to be used for heating and processing. If necessary, heat can be drawn off during the storing process.

This is where Progress comes from
This is where progress comes from — progress and warmth and light and happiness.
It starts with a raindrop, a clear mountain spring, a tumbling stream ..... Massive man-made barriers harnessing the oppressive weight of imprisoned waters to hurl a roaring torrent against the flying vanes of a waterwheel in its savage drive to escape ..... While the eternally patient process of evaporation lifts water back into the skies to form more cloudfuls of progress the waterwheels, their turbines and generators continue their never-tiring service sending a steady flow of electric power across the land into factories, streets, hospitals, schools, homes.
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4 new reasons why Cyanamid research helps you

WHETHER YOU *make* or merely use paper, paint, electrical equipment, plastics—or virtually anything else—Cyanamid's intensive, progressive research constantly produces for you. Here are just four new developments that we think you should know about:

Better Paper—Lower Cost. ACCURAC* 24 retention aid is a new and highly effective aid to paper-makers. It efficiently retains fillers and costly pigments such as Titanium Dioxide, as well as colored pigments. It permits matching of color specifications, with less *pigment*. Retention of fines gives improved sheet formation, less fines in white water, less load on save-alls, less two-sidedness in colored paper—*and* faster machine drainage! Better paper at lower cost with ACCURAC 24 is good news to producers and users alike.

Light without Bulbs—and More. CYANOCEL* chemically modified cellulose is being hailed by the electrical industry. Its properties of high dielectric constant and low-dissipation factor can improve many existing electronic products. *Electroluminescence*, for instance! A sheet of pure light in any shape and many colors for walls, ceilings and decorations is a distinct promise. Its first commercial application is in a new electroluminescent lamp, in which CYANOCEL is cast as a thin, phosphor-containing film between conducting surfaces, one of which is transparent. Because of the high dielectric properties of films, it promises a significant step forward in the miniaturization of capacitors and other electric components.

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How Financial "PR" is Handled Now

Mergers, mutual funds, the need for capital, the changing character of companies—all these add up to a growing need for financial public relations.

AS THE RESULT of its diversification program a shipping company with extensive Latin American investments shifted the major source of its income to the U. S. chemical industry. To much of the investing public, however, the company name continued to call forth an honorable but stagnant enterprise. At a time when chemical shares were selling at a price equivalent to 20-to-25 times annual per share earnings, this company's shares were selling for 11 times earnings.

This is a rather dramatic example of why one North American company established a program of financial public relations. The figures, in fact, accurately reflect the situation that the U.S.A.'s W. R. Grace & Co. found itself in a few years ago. As the final step in an effort to correct the situation, Grace recently created a new title: director of investor relations.

Another company, Celanese Corp. of America, credits its financial "pr" program for a decrease in its borrowing costs. A decade ago, Celanese was not as well known as it is today, and the company was forced to pay above-market rates on its bonds. Three years after its financial "pr" campaign was started, Celanese placed a $200-million bond issue at market rates.

American companies are now generally aware of a need for financial public relations. The need is beginning to be felt elsewhere.

There is considerable pressure for companies to publish more financial information. Partly this is due to the tremendous growth in the investing public. Partly it is due to the necessity of raising capital, of "going public," of listing shares on a stock exchange. And partly, the surge of mergers and diversification is responsible.

• **Shock Treatment**—Sometimes the need for financial public relations comes as a shock. In Britain, it was the threat of widespread nationalization of industry by the old Labor government. The London stock exchange hired a public-relations consultant in 1951, and soon realized the need for continuing publicity. The Exchange was followed by the big merchant banks and insurance companies.

Bowater, Ltd., the paper company, took up financial "pr" with a flair. Bowaters is now known for its lavish annual meetings (held in London's Festival Hall), its glossy company reports, its substantial half-year statements, its annual Chairman's Luncheon for financial journalists. Unusual events that may affect the company's shares are announced to stockholders in a personal letter from the Chairman. "PR" policies are made within the company, but Bowaters retains outside public-relations agencies to help carry out the policies.

While Bowaters' program could serve as a model, it may be helpful to review how financial "pr" is handled in the U.S.A. "PR" can be divided into two main areas: treatment of the company's own shareholders, and treatment of the financial community as represented by the professional securities analyst. (In many places, of course, the analyst's role is still filled by the local banker and broker.)

I. The Shareholder

A few smaller U. S. companies send letters of welcome to new shareholders, with a booklet on the company's operations. This practice serves an especially useful purpose if a company has been passing through a period of transition.

Sending letters to shareholders who have sold their shares, after a considerable period of ownership, is also practiced by a few companies. The letters express the hope that the investor will "return to the fold" sometime in the future.

• **Annual Report**—In general, shareholders do not know how to read a detailed financial statement. As far as possible, language understandable to the layman is used in place of technical accounting terms. Undoubtedly the greatest aid to the investor is a profit-per-share figure.

Because financial statements are such a mystery, companies have turned more and more to words and pictures to tell their story. Many companies resort to eye-catching techniques such as using an artist's sketches or presenting the president's report in interview form.

Consumer-goods companies in particular tend to publish rather lavish annual reports. They have awakened to the fact that shareholders are also consumers—who should be made loyal customers of the company.

• **Annual Meetings**—Some companies send out separate invitations to the annual meeting, in addition to an announcement in the annual report. Some companies rotate their meetings from city to city, but this is far from standard practice. A few companies pay transportation, and some provide lunch.

Management should not be misled by the shareholder meetings of a huge company like American Telephone—the tens of thousands of people still represent only a fraction of the total. The Volkswagen company was over-optimistic in planning for its first shareholder meeting last spring—and was disappointed by the small turnout.

Plant tours for shareholders are a natural gesture when annual meetings are held near plants. Or there can be exhibits of products or distribution of cheap items.

It should be noted that the annual meeting has become a time of trial for many chief executives. In recent years, a new kind of "professional" shareholder has appeared on the U. S. scene. Owning a few shares in many companies, they turn up at dozens of annual meetings to propagandize pet reform measures.

Instead of facing a "happy family" of shareholders, the chief executive finds himself defending company policies against aggressive attack. But these attacks have brought home to management the need for a good public relations ad-

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viser—as one function, to anticipate embarrassing questions.

II. The Analyst

Most investors buy shares as the result of information or advice supplied by a stock broker, an investment adviser, a trust officer. To carry the process one step further, the information supplied by the adviser comes from a securities analyst. And these are the men who determine, to a large extent, whether a company's shares are purchased by the big mutual funds and other institutional investors.

These analysts also have a major voice in what foreign securities are bought by U. S. investors, and they determine whether new investment capital will be made available. On their trips abroad they complain about the lack of data.

In the U.S.A., there are over 4,000 professional analysts. Close to half belong to the New York Society of Financial Analysts. An invitation to address a luncheon meeting of this group is considered the high-water mark of financial public relations.

• **Reports**—As a rule, analysts expect to receive all the financial communications that go to stockholders and the press—they prefer to read the original press release.

In contrast to the general public, analysts expect complete details about capital structure, such as the amount of debt, preferred shares, common shares, cash surplus. They want an earnings record going back at least 10 years. They would like to have a full balance sheet included with interim statements; for many companies this is not practical.

Some companies try to include information for analysts in shareholder reports. Others tuck into the report a loose page of statistics and operating ratios. A few prepare a special booklet for analysts only.

• **Relations**—Since they tend to specialize, analysts do not expect to be treated alike. It is considered proper for management to cultivate the few analysts who show a keen interest in the company.

Companies quickly learn that analysts like to deal with top executives. Telephone calls from analysts carry a very high priority in most U. S. companies. And analysts are very receptive to top-executive dinners and receptions. ●

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The evolution of quality control . . .

1. Operator stage

Early in the industrial evolution one worker or group of workers was responsible for the manufacture and quality of entire products. This phase lasted until the early years of this century.

2. Foreman stage

Modern factory organization brought together many men performing similar tasks. The foreman assumed responsibility for product quality under this system. This phase lasted until World War I.

3. Inspection stage

As manufacturing became more complex, full-time inspectors appeared on the scene. During the 1930s, inspection reached its peak, with huge departments headed by their own superintendents.

4. Statistical stage

During World War II, mass production led to greater inspection efficiency. This stage, still in progress, is characterized by sampling and control techniques. But inspection is still the basic function.

Now, the "Total Quality" Stage

SINCE 1900, a new stage of quality control has taken hold of industry roughly every 20 years. According to this schedule, industry should now be ready for a new stage; the emphasis on statistics has been apparent since the 1940s.

Sure enough, quality control men are now propagating a new idea, the concept of "total quality" control. By this they mean that quality control should be moved from the shop floor into top management's front office.

To control product quality as management sees it—or should see it—you have to control the "whole package" and not just pieces of product quality. Quality control begins with product research, continues through design, production, and the purchase of parts and materials, and on through the distribution system until the product is in the customer's hands. Even then quality control does not stop. Customers' complaints, service facilities, and product performance information are also important parts of the "total quality" problem.

• **Chief Propagator**—The father of this "total quality" concept is Dr. A. V. Feigenbaum, manager of quality control services with General Electric Co. and president of the American Society for Quality Control (ASQC). Dr. Feigenbaum introduced the idea in 1956 with a report in the *Harvard Business Review*. Since then it has become an article of faith of the ASQC.

And Feigenbaum continues to preach his management approach to quality control. He has written the first book on the subject, *Total Quality Control*, recently published by McGraw-Hill, which will be used in ASQC training classes. He introduced his theory to quality-control practitioners in Latin America last year (Argentina has a very active association).

This month Feigenbaum will be one of the feature speakers at the Turin, Italy, meeting of the European Organization for Quality Control (EOQC). At this meeting he will outline the importance of quality control to management, and tell how a new breed of quality-control engineer is developing.

I. Management Problem

Product quality is a basic element of business strategy. Product appearance, for instance, has become of paramount importance to many companies, even companies that make heavy machinery. There is a continuing debate over the merits of maximum durability versus "planned obsolescence." Management must decide how much reliability to build into its products.

Economic factors can influence quality decisions. Feigenbaum points out that inflation can be a "powerful motivator for careless purchasing." Thus in an inflationary economy, management may tend to make products with "just enough" quality. As inflation slows down, attitudes toward product quality change.

Feigenbaum believes that alert managements can recognize such changes. He says the U.S. automobile industry is a good example. Last year, for the first time in many years, auto companies put more sales emphasis on performance warranties than on the latest gadgets or minor design changes.

• **Technical Demands** — More complex technology in general, and automation in particular, is also forcing changed attitudes.

"Industrialists are coming to realize that automation cannot be successful unless the system is closed through mechanized quality control," Feigenbaum comments. And he adds: "I am not talking about the 'afterthought' gages that are frequently tacked on to a mechanized production line or even the mechanized sorting devices that merely give us more bad products faster."

Rather he means equipment that prevents failure before it occurs, and this equipment "should be considered as much a part of the manufacturing system as conveyors or punch presses."

• **Cost Factor**—Management has another compelling reason to pay attention to "total quality." Feigenbaum estimates that most manufacturing companies spend a minimum of 7% of their total sales income on inspection and testing, scrap, spoilage and rework, customer complaints, and similar expenses. He believes the figure often runs to well over 10% of sales income.

Dr. Feigenbaum bases his estimate on his personal knowledge of cost factors in U.S. plants. How high quality costs run in other nations he does not know. But they could be higher where more direct labor is used, where management is more willing to rework poor-quality output. Quality-control problems probably differ more in emphasis than in magnitude.

According to Feigenbaum, a company with a 7% quality cost factor should be able to reduce the figure to 5%—making 2% of sales available for profit.

II. New Technology

To meet this challenge of "total quality" control, Feigenbaum says, a new technology is coming into being. He calls it "quality engineering." This is not merely a new label for the quality-control technician, he says, or a "technologically-flavored title for the industrial statistician." It is a combination of engineering and management, encompassing reliability engineering, equipment design, nondestructive testing, laboratory analysis, process control engineering, and statistical methods.

The ASQC is currently trying to establish requirements for quality

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engineering, with a view to setting up professional licensing standards. Feigenbaum is convinced that engineering schools will someday offer degrees in quality engineering, on a par with electrical or mechanical courses.

• **What He Does**—Where does the quality engineer fit into the company organization? Feigenbaum sees him as manager of quality control, performing a staff service to manufacturing management. He would be on the same organizational level as the manager of manufacturing engineering or manager of materials.

The quality control manager is responsible for identifying quality-related costs and bringing them to the attention of operating management. And he should think of quality problems in terms of cost, rather than in the "abstract language of the control chart."

He must see that quality information is communicated to everyone whose actions affect quality. He reports on the progress of the quality control program. He is also responsible for teaching quality-control procedures and techniques.

• **Technical Duties**—The quality-control manager should play a major role in the planning of new products. He does not usurp any of the functions of the marketing or market-research departments. Rather he acts as a "marriage counselor" between engineering specifications and manufacturing capabilities—suggesting compromises in the light of a specific quality objective.

He plans the in-process controls needed to insure consistent quality: the control points, measurements to be taken, the measuring tools. He specifies, and in some cases designs, measuring and control equipment.

He makes special studies of the capabilities of manufacturing equipment, searching for sources of poor quality, for ways to improve quality.

He provides the purchasing department with clear and precise data for establishing control over incoming materials—to put the major burden for quality control on the supplier. Especially with a mechanized production line, control over incoming parts can be critical. For one G.E. product, Feigenbaum says, a 1% reject level on incoming materials is enough to cause the equipment to be out of order 50% of the time.

III. Plan of Attack

For the best results, the quality-control manager should concentrate on reducing failure costs: the cost of spoilage and customer complaints, for example. In plants still in the third or fourth stage of quality control, the usual approach is to try to improve failure rates by increasing inspection costs. In contrast, "total quality" control calls for a sharp increase in prevention costs—through the application of quality engineering.

As a case in point, Feigenbaum tells how one company set about cutting its quality expenses from 7% down to 5% of sales. The plan called for increasing prevention costs from 0.70% of sales to 1.25%, with the overall reduction in expenses coming from lower costs for failure and inspection.

• **Case History** — Feigenbaum gives a more complete history of how a company saved $500,000 within two years after adopting a "total quality" program. This case involved an electrical-equipment organization with annual sales of $10-million.

When the program was started, the quality control manager calculated that quality-related costs accounted for 10% of plant-output expense. Within a year, quality costs had been reduced to 6.3% of output expense; within another year the figure had dropped to 4.9% and was still falling (it eventually reached 4.5%).

Over this two year period, the actual savings were these:

—Scrap reduced 46%, saving $143,782.

—Rework reduced 46.8%, saving $183,000.

—Material acceptance costs reduced 76.7%, saving $15,300.

—Customer complaints reduced 54%, saving $16,516.

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—Tool maintenance reduced 10.5%, saving $31,755.

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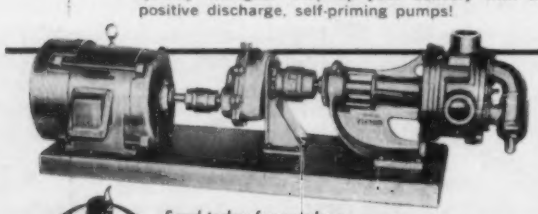

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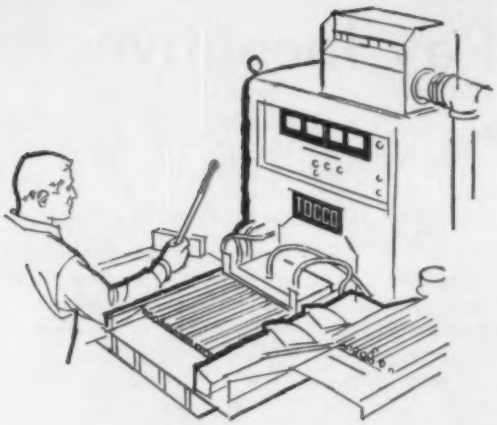

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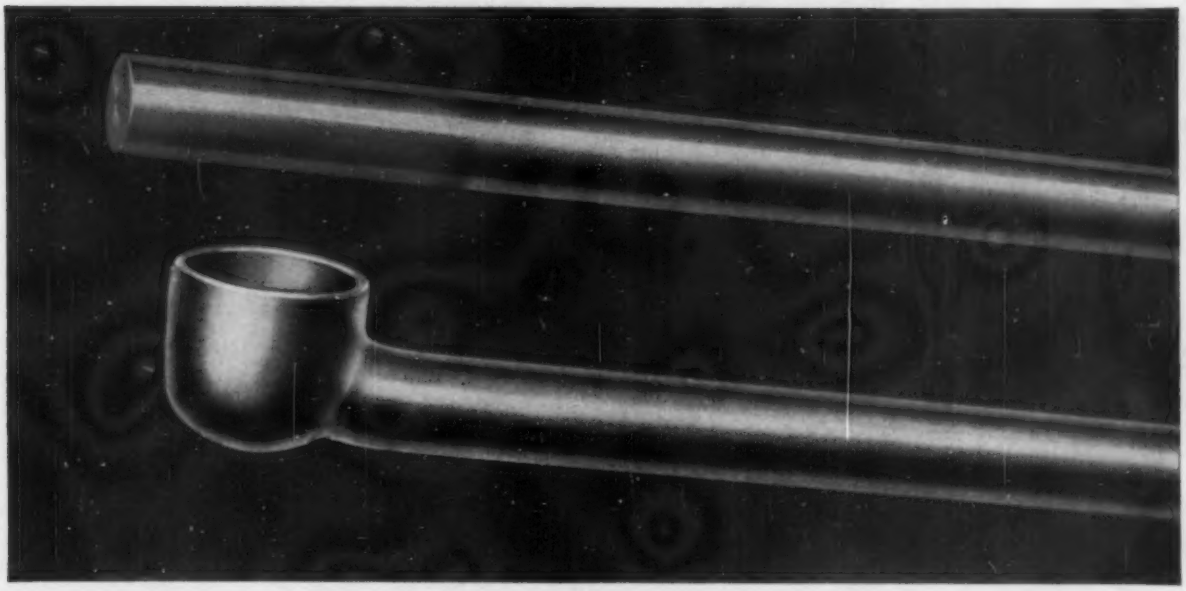

Engineers at Thompson Products Michigan Division of Thompson Ramo Wooldridge, Inc. recently changed from gas-fired furnaces to fully automatic TOCCO. Application: heating for forging of automotive tie rods. Result: a substantial reduction in direct labor costs, saving thousands of dollars a year on this heating for forging operation. *Annual savings actually amortize the cost of the TOCCO installation in about one year.*

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A Bird's Eye View of Pay Incentives

An experiment with pigeons indicates that wage incentives may be headed in the wrong direction.

BY SOILING PEDESTRIANS, besmirching office buildings, and fouling heroic statues in the parks of the world, pigeons have earned the enmity of man. The pigeon problem in Trafalgar Square has been raised in Parliament; Paris has embarked on a "birth control" scheme; New York is practicing limited pigeoncide. But before joining the hate campaign, businessmen should take pause. One scientific investigator has just announced that pigeons can be of great service to management.

From his study of pigeon responses, Owen Aldis, a Visiting Scholar at Harvard University, concludes that current trends in wage incentives may be going in the wrong direction. He describes his experiments in the *Harvard Business Review* (July/August, p59), and offers practical implications that "could not only improve production rates but make working much more interesting and exciting."

Aldis acknowledges that overgeneralizing can be dangerous; he offers his conclusions strictly as speculation. "I also realize," he writes, "that labor unions might wax indignant if they ever thought their members were to be manipulated as cavalierly as have been our pigeons."

I. In Pigeon Terms

In Aldis's experiments, pigeons were given simple tasks to perform, such as pecking a key. For performing this chore, they were rewarded with food or water. And by changing the "wage" schedule, Aldis was able to test the effectiveness of various payment schemes.

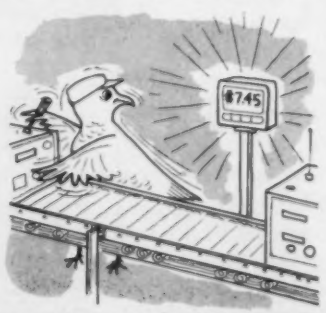
The most effective way to stimulate hard work in pigeons is to pay them after each task is performed. When Hillary climbed Mount Everest, Aldis notes, he paid his bearers at the end of each day's climb; otherwise, they would not work. For the human or pigeon, such immediate rewards are hard to beat—except that in Hillary's case he was forced to carry heavy sacks of coin as extra baggage.

The second most effective system is a "variable ratio" schedule. The pigeon is paid a standard rate but at varying intervals. Sometimes he is paid after two pecks, sometimes after 20 pecks. Apparently, a "get-rich-quick" mentality is what makes this payment scheme work. Aldis says that "pigeons paid well at first will work harder and harder for less and less frequent payments." Some pigeons have made as many as 220,000 pecks without being rewarded, following long exposure to a high variable-ratio schedule.

Third in effectiveness is a fixed ratio schedule, or in human terms, piece-work payment. The faster the pigeon works, the more reward he gets. But note an interesting phenomenon: A pigeon paid one kernel of corn for every 10 pecks will work faster than if he is paid 10 kernels in a lump sum after 100 pecks.

• **Weak Response**—At the bottom of the incentive list come time-based schedules. Variable-interval schedules—creating a situation similar to a company having trouble meeting its payroll—are not well received by pigeon or man. Still, a pigeon will continue to work long after all pay has stopped, because he has no way of knowing there will in fact be no more pay.

Fixed-interval schedules, which in human terms approximate regular weekly or biweekly payments, bring the weakest response of all from pigeons. And this finding, Aldis feels, "must surely be an eye-opener to businessmen."



The working pigeon wants immediate reward—and so might human workers.

II. Case for Piece Rates

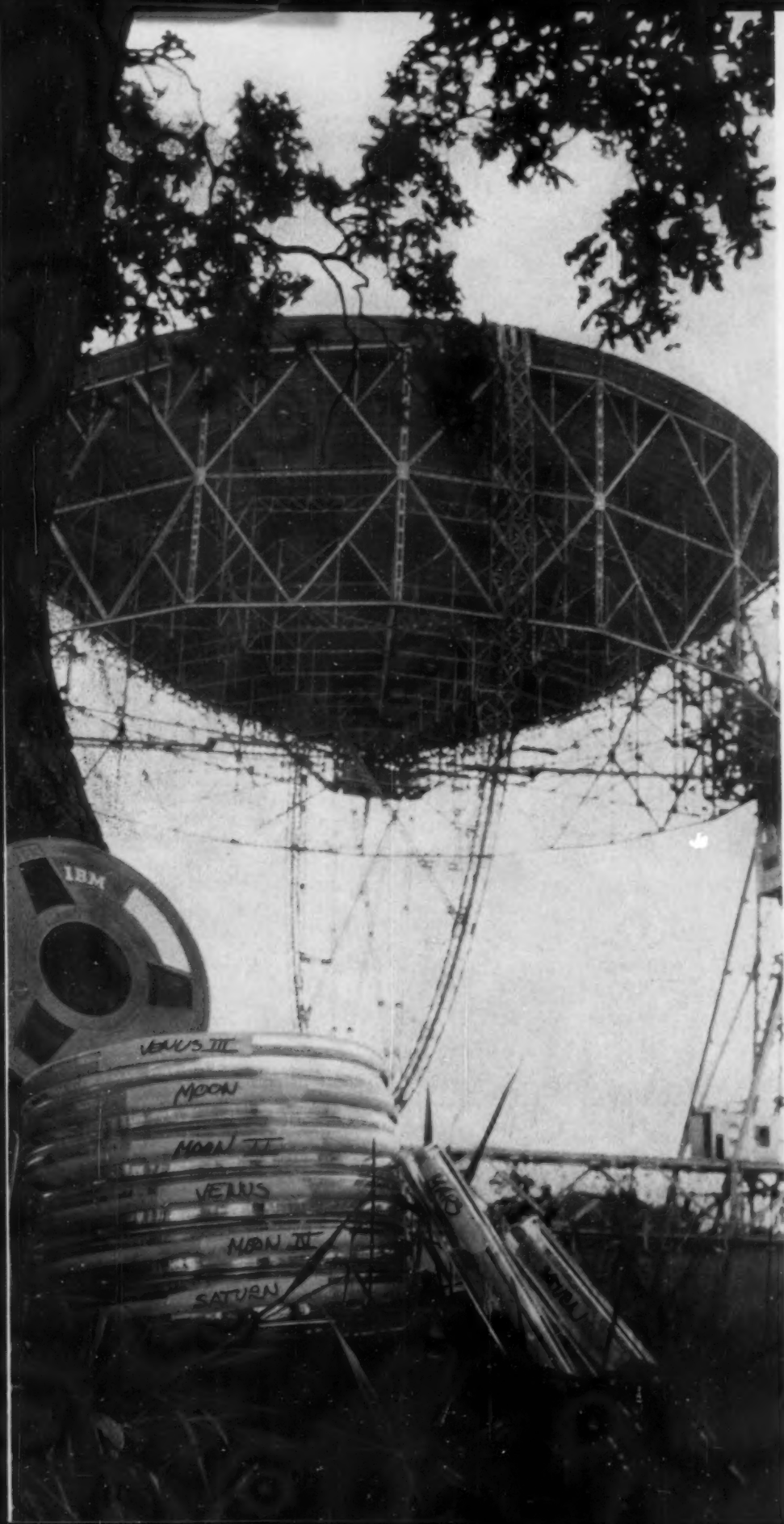
If immediate rewards do increase work output, Aldis asks, would this not outweigh the conveniences of bookkeeping that are inherent in regular salary schedules? Even small delays in rewarding can destroy a certain amount of working incentive, he points out. And "just consider how much motivation is lost when a man works for a week and then has to stand in a pay line for his reward."

Pigeons are no different from civil servants in their reaction to time-based payment schemes. Their tendency to dawdle may account for the large amount of supervision required when regular wages are paid. Since supervision is essentially negative, carrying a veiled threat of discipline, an excess is likely to breed hostility in the worker. This leads Aldis to "the case for piece rates":

"Any wage system that can cut down supervision should improve worker morale. If, at the same time, this system increases worker productivity, what more can management ask?"

• **Why the Trend?**—Since piece-rates are so clearly superior to time-based pay, Aldis argues, there must be other reasons why management is turning away from piece rates. He identifies three reasons: (1) management has learned that workers tend to determine their own pace of work, regardless of piece-rate standards; (2) mechanization is transferring the control of output from man to machines; (3) technical innovations are made unevenly in plants, which makes it difficult to equate piece-rates under different conditions.

Aldis notes that when management and labor cannot agree on piece-rate standards, they often decide on a switch to non-piece rates. Usually the result is improved morale and increased production; and this result is sometimes taken as a sign that non-piece rates have greater motivating power than piece rates. Aldis comments: "Our



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A watch on space in a quiet meadow

A huge silvery dish swinging high above a lush Cheshire meadow has been teamed with IBM computers 6,000 miles away in California to link scientists on the ground to probes far out in space. The dish is the Jodrell Bank radio telescope at the University of Manchester, the largest fully steerable radio antenna in the world. The computers are in the Space Technology Laboratories, Inc. centre in Los Angeles. Together with smaller antennas, they have formed a world-wide tracking network.

Far out in space—they've been tracked up to 22 million miles—the vehicles, little larger than a beach ball, speed at almost 20,000 miles an hour. To pinpoint signals as a probe swings up over the horizon, each tracking antenna must be aimed with exquisite precision—the computers' job. Fed information rushed from each tracking antenna in turn, the computers can compare it with celestial data in their memories and race through complex calculations to find a probe's trajectory and speed. These are needed to aim the next antenna in the network and thus track a probe continuously.

Space exploration would be impossible without computers to analyse data, carry out involved calculations. IBM data processing systems do this sort of thing fairly quickly. A problem that would take 800 years to solve with pencil and paper can be cracked by an IBM 7090 in just five minutes.

Few scientists have the patience to wait 800 years for an answer; advanced research laboratories all over the world are equipped with IBM high-speed computers.

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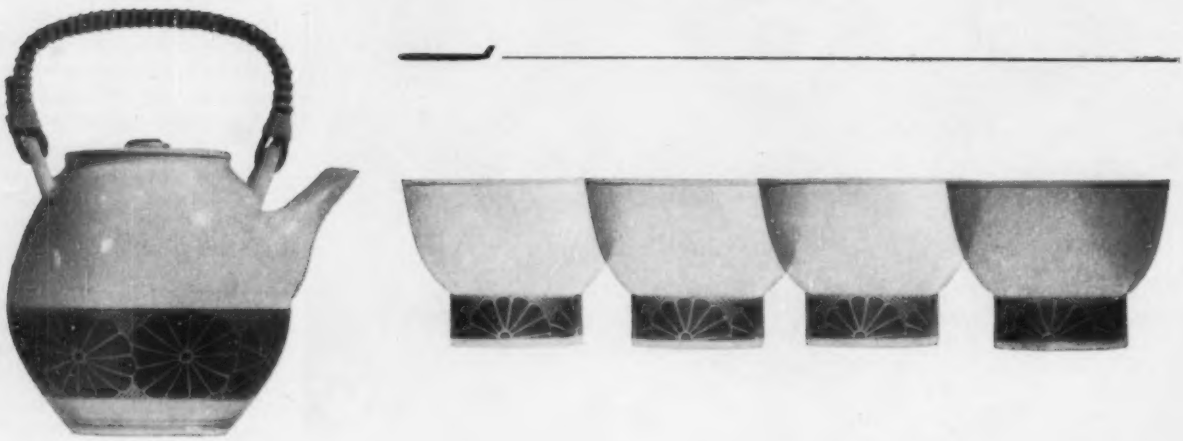

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experiments suggest that a renewed effort to straighten out inequities in the piece-rate system might, over the long run, have been more effective."

Aldis does not say that piece rates are a panacea for increasing worker productivity. But the evidence is strong enough to compel businessmen to re-evaluate their attitude toward piece rates.

III. Pay Schemes

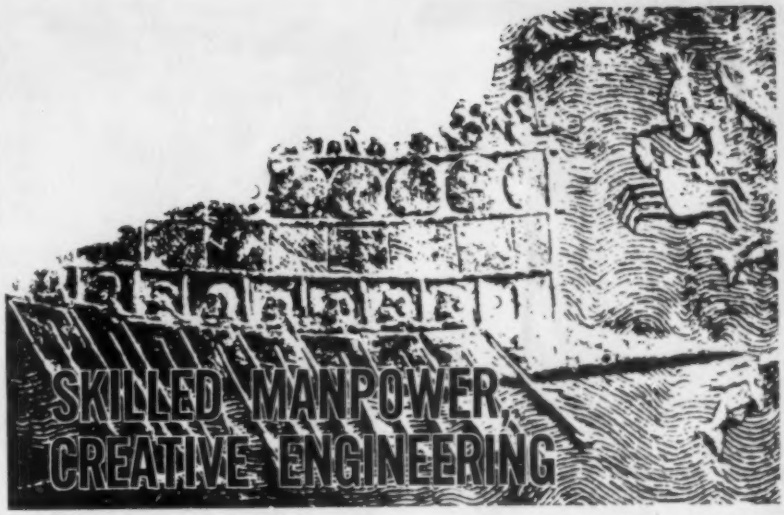
Aldis believes his findings can be used to make incentive schemes much more exciting for workers. Pigeons work harder when paid in uneven amounts, for instance, and they maintain these higher productivity levels. This reminds Aldis of the annual bonus, which more often than not has become a "ritualized salary supplement." From the standpoint of creating incentives, it would be much better to distribute the total bonus at irregular intervals throughout the year, in small sums depending on the amount of work done.

Another suggestion: introduce an element of uncertainty to heighten interest in work. Why not "double or nothing" pay? Workers might be paid, say, $1 for producing each of three units; then for the fourth unit they would be paid $2 or nothing, depending on some sort of appropriate random-chance factor.

And why not a factory lottery? Each week a worker's name or number is pulled out of a hat. How much he wins could depend on how much his work exceeded standard that week.

• **Paymeters**—Aldis would also like to see small devices similar to taximeters attached to machines in a factory. When a worker has accomplished a certain amount of work, a bell would ring and the amount earned would flash before the worker. "Under a set-up like this," Aldis says, "he might have to be pulled away from the line for a coffee break."

This rather crude system might prove too complicated in practice, of course. But experimenting with it might lead to a workable system. And even a crude immediate-reward system might work in less-developed nations where workers are not conditioned to delayed-payment customs. ●



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After the twice-monthly meeting, the group breaks up into six two-man inspection teams. Their inspection tours are made without advance notice, but relations are informal and friendly with the departmental foremen, whose suggestions are welcomed on the tour. Remedial action is planned on the spot. The inspector-supervisors also discuss with the foreman any general safety problems he may be facing.

After the tour, each inspector submits notes to the secretary of the safety group. Within five days, a mimeographed report is delivered to the group members, to foremen concerned, and to top plant-operating management. A week and a half is allowed for correcting safety hazards. ●

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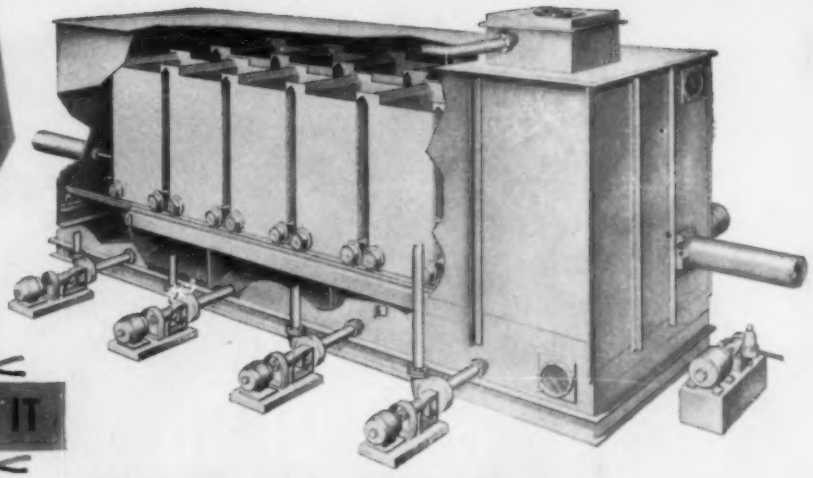

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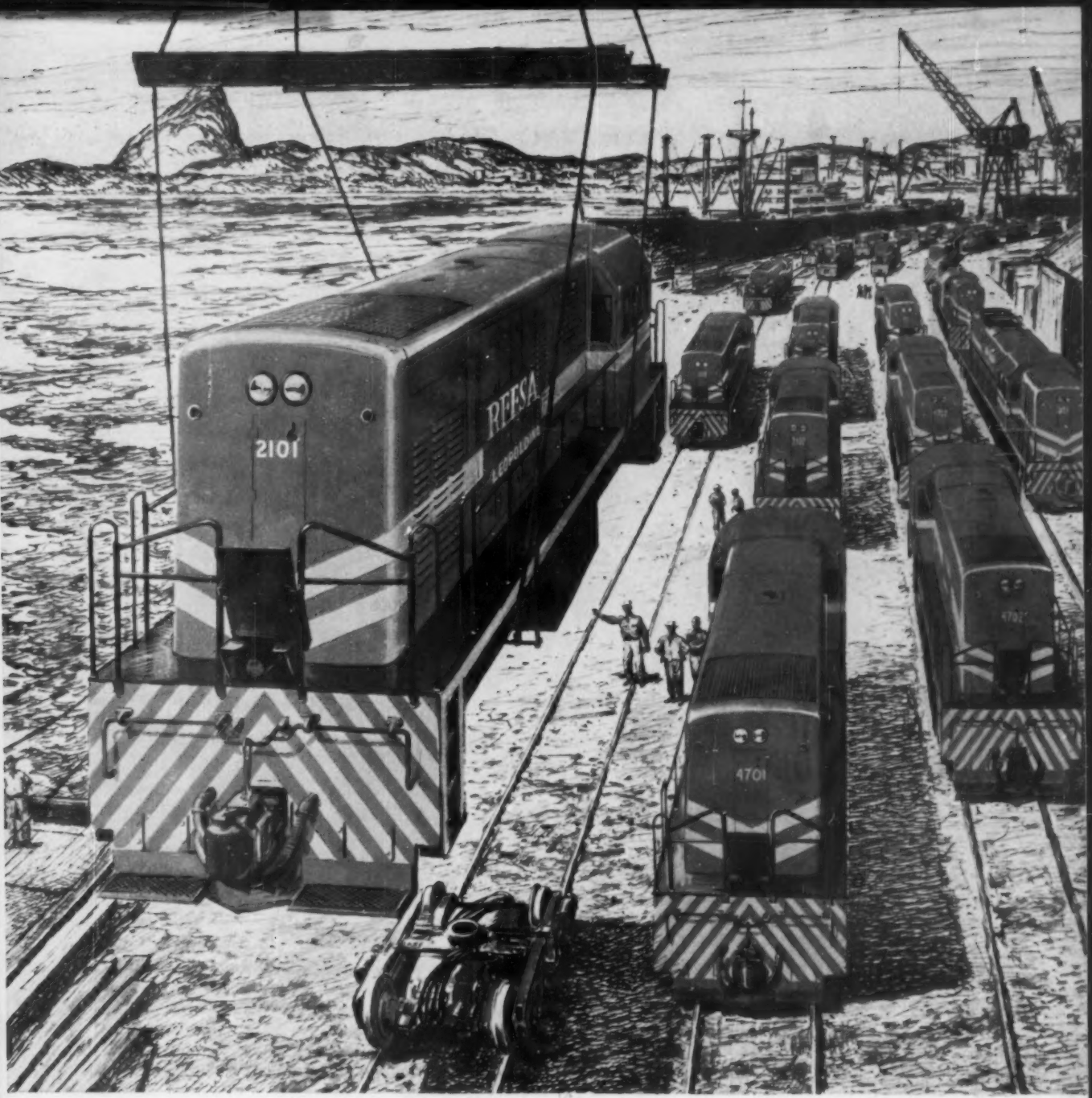

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Recommended Reading

[NEW BOOKS]

SUPERMARKETING, by Dr. Frank J. Charvat, surveys supermarket development in the U.S.—from the experiments of the 1920's to the larger, more lavish stores of today. Chapters on sales, gross margins, costs, and balance sheet factors provide a comprehensive statistical picture of supermarket operations. The effects of supermarketing are described: the reaction of the large grocery chains, the trend toward horizontal integration and the decline of the specialty food shop. *Macmillan Company, 60 Fifth Avenue, New York, N.Y., U.S.A.* 288 *pages,* $6.95.

Although PRECIS DE METROLOGIE (Outline of Metrology), by Charles Minaire, is published in French, it does not require a detailed knowledge of the language for understanding. The book is well illustrated and most of the examples of the science of weights and measures are self-explanatory. The author covers the general principles of inspecting mechanical products, various standards for lengths and angles, and shows how to use equipment, including a chapter on positioning work for machining. *Editions BPI, 79 Ave des Champs-Elysees, Paris 8, France.* 140 *pages,* $6.30 *or* 31.50 *NF.*

HIRE PURCHASE IN A FREE SOCIETY, by Ralph Harris, Margot Naylor, and Arthur Seldon, is your guide to how hire purchase works. This new third edition has been extensively revised and now includes descriptions of installment lending in a number of countries. *Hutchinson & Co. Ltd., 178-202 Great Portland Street, London W1, England.* 319 *pages,* 30*s.*

Tomas Roberto Fillol, an Argentine social scientist and businessman, gives his views on Argentina's economy and national character in his SOCIAL FACTORS IN ECONOMIC DEVELOPMENT. *The Massachusetts Institute of Technology Press, Cambridge 39, Mass., U.S.A.* $3.75.

ADVERTISING . . A NEW APPROACH, by Walter Taplin—Britain's first professor of advertising—provides an interesting and stimulating analysis of what advertisers are trying to do and some of the problems they face doing it. *Hutchinson & Co., Ireland Yard, St. Andrew's Hill, London EC4, England.* 208 *pages,* 25*s. or* $3.50.

[DIRECTORIES, REFERENCES]

Just published: The newest edition of PROPERTIES AND SELECTION OF METALS, edited by Taylor Lyman. More than 1,300 specialists have contributed to this work—discussing cost, availability, fabricability, strength vs. weight, plus sections on stainless steels, precipitation-hardening alloys, aluminum, copper and the other metals. The handbook also presents over 1,500 "case method" examples of materials selection. *American Society for Metals, Novelty, Ohio, U.S.A.* 1300 *pages,* $30.00.

REPERTORIO DE LAS EMPRESAS SIDERURGICAS LATINOAMERICANAS 1960/61 provides information on over 200 Latin American Steel companies—names and addresses, facilities and equipment, and types and quality of products. *Instituto Latinoamericano del Fierro y El Acero, Casilla* 13810, *Santiago, Chile.* 162 *pages,* $12.00. . . . Also note *Industria* magazine's review of the 100 largest Latin American industrial companies, ranked according to sales volume. Write to *Industria,* 330 *West* 42*nd St, New York* 36, *N.Y.*

[REPORTS, PAMPHLETS]

GUIDE TO INVESTMENT IN GREECE is a valuable source of information about this nation's economy. It contains data on raw materials, labor, cost factors, taxation, incentives, procedure for establishing enterprises and legislation for the protection of foreign capital. *Industrial Development Corp. 8 Dragatsaniou St., Athens, Greece.* 110 *pages,* $5.00.

Contimart—a European marketing research organization—has just released its latest report, MARKETING TOURISM AND TRAVEL. It provides data on world tourism, growth potentials, the marketing picture, air travel, competition between air and sea transportation, tourism, advertising and promotion. *Contimart AG, Militarstrasse 76, Zurich Switzerland.* 60 *pages,* $20.00.

The Columbia Law Review Vol. 61, No. 3. offers a collection of articles by leading experts on legal-economic problems of international trade. Some of the subjects covered: tax policy and the gold problem, worldwide international economic institutions, anti-trust regulations within the EEC, the Buy-American Act, trade adjustment bills and U.S. participation in GATT. *Columbia Law Review, Kent Hall, Columbia University, New York* 27, *N.Y., U.S.A.* 570 *pages,* $2.50.

[INDUSTRY BULLETINS]

Alcoa will send you a copy of their latest catalog—DESIGN WITH 'ALCOA VYNALATE.' It contains a sample of this new vinyl-aluminum laminate material and chips of 39 special vinyl color-pattern combinations. *Aluminum Company of America, 720 Alcoa Bldg., Pittsburgh 19, Pa., U.S.A.*

A new technical bulletin provides information on the processing of cast polypropylene films. Data includes typical property ranges of Pro-fax film, plus a table that compares competitive films. *Hercules Powder Co., Hercules Tower, 910 Market St., Wilmington 99, Del., U.S.A.*

Personal Business

Educational opportunity in the U.S.

Do you have a son, daughter, friend or employee who is eager to study in the United States? There are more "wandering scholars" now than at any time in history, and the U.S. draws large numbers of them—a record 53,000 during 1960-61. They come because of America's wide variety of educational institutions and facilities for special study. And they are welcomed for the enrichment they bring to college life.

Many students are helped by the ever-increasing number of scholarships. Last year about 36% of the total came on private scholarships and awards, about 16% with government aid. Another 30% were self-supporting—a sharp decrease from recent years.

Where do these young people come from? In 1960-61 the majority—36%—were from the Far East, 18% from Latin America, 17% from the Middle East and Africa, 13% from Europe. Half were registered as undergraduates, 40% as graduate students. Engineering attracts most of them, then the humanities, the natural and social sciences, business, medicine.

It is by no means too early to start planning for the next academic year (Sept. '62—June '63). Gaining admission to a college, or obtaining a scholarship, can take a full year. There are many things to consider: How does the educational system in your country differ from that in the U.S.? What level (undergraduate or graduate) would be appropriate? What college should the student apply to? How will he finance his studies? Is his English good enough for him to get the full benefit of studying in the States?

As a first step, talk with someone at your local U.S. diplomatic mission—a Public Affairs Officer or U.S. Information Service attache. You will find some useful books in their libraries, too—in particular, *American Universities and Colleges* (American Council on Education, Washington, D.C., 1956).

For the undergraduate, there are hundreds of colleges where students follow a four-year program of study leading to the degree of Bachelor of Arts or Science. (Note that in the U.S. the term *college* is used for an institution for undergraduate study; the *university* is an extension of the college: It usually consists of an arts and science college together with a graduate school in arts and sciences and one or more professional schools—in law, business, etc.)

The privately endowed arts and sciences colleges have several advantages for students from overseas: They are smaller than the state colleges; most are residential (with students living in dormitories), and classes are smaller. It is wise to apply to two or three colleges at the same time.

Many students from abroad do not study for a degree. And they are often admitted at a stage beyond the "freshman" or first-year level. Incidentally, many of them find certain restrictions at U.S. colleges irksome: Attendance at classes is often obligatory, as are some subjects. But many of these regulations are relaxed after the first two years.

How does one qualify for admission? Colleges differ in their requirements, but they all insist on two things: (1) proof that the student has had the equivalent of a U.S. secondary education, (2) that he or she is proficient in English. (Note that colleges are becoming stricter in their English requirements.) You can get an application form by writing to any college or university admissions office.

Costs vary, but they are generally higher on the northeast and west coasts than elsewhere. You can expect tuition to cost from $300 to $900, room, meals, and incidental expenses $1,000 to $1,600 per year.

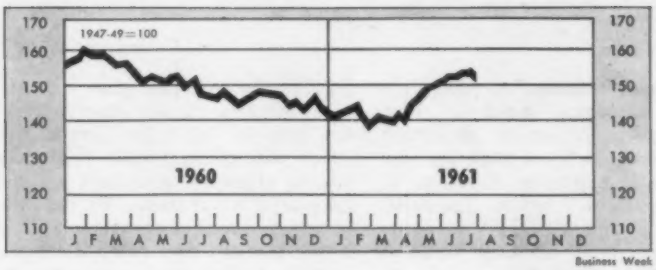
Most colleges have scholarship programs, some of which are expressly for foreign students. Your best sources of information on all scholarships are the individual college catalogs, UNESCO's *Study Abroad* (Paris, $2.00), and the *Handbook of International Study* published by the Institute of International Education (800 2nd Ave., New York; $3.00).

To get into a graduate school students must have a bachelor's degree or the equivalent, have a high academic record and, again, be proficient in English. You will probably think first of the older, larger, "Ivy League" graduate schools. But some of the smaller ones are also well equipped and staffed. You will find it helpful to compare the catalogs of the different schools. Catalogs also give estimates of costs (usually $2,500 a year) and scholarships. Note that graduates are favored for the grants offered by the U.S. and other governments.

You will find that many American universities have traditional links with particular areas: The Univ. of Massachusetts has a historic link with Hokkaido Univ. in Japan, Princeton with Roberts College in Turkey; Miami has always looked toward Latin America.

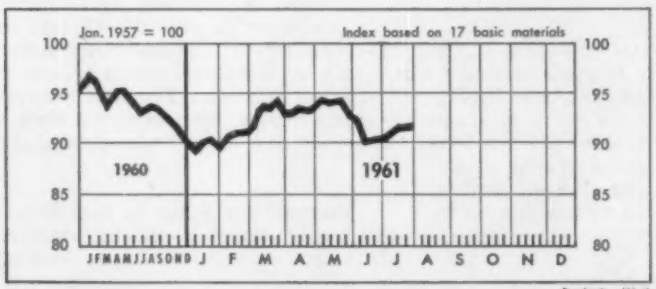
Since the war, programs like the U.S. government's International Cooperation Administration have brought thousands of students to the U.S. on special programs. Brazilians and Pakistanis come to the Univ. of Southern California to study public administration; business graduates from Buenos Aires spend a year at Columbia Business School; Kentucky has a program for Indonesian trainees in engineering and agriculture. Organizations like the International Assoc. for the Exchange of Students for Technical Experience or the International Assoc. of Students in Economics and Commerce serve a similar purpose through their national committees.

Business at a Glance



U.S. Business Trend

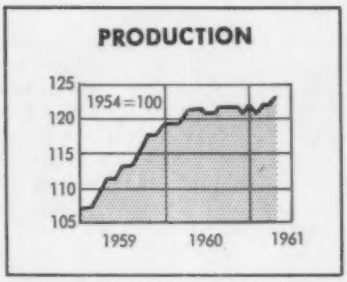
Despite the summer slowdown (left), business was ready to push higher even before President Kennedy's call for more defense spending. Now, recovery will move even faster and most believe the economy can absorb the new spending without strain. Yet inflation talk persists – especially in Wall Street, and Washington is determined to fight unwarranted wage and price rises.

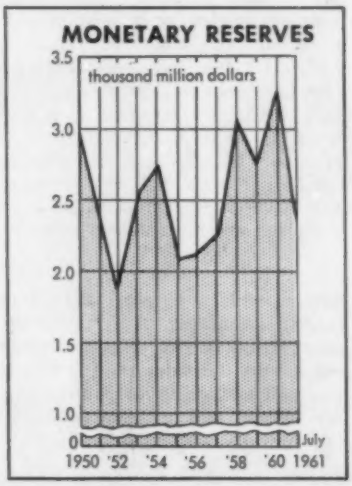


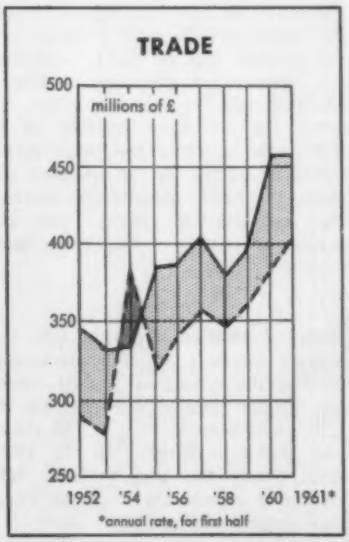
U.S. Commodity Trend

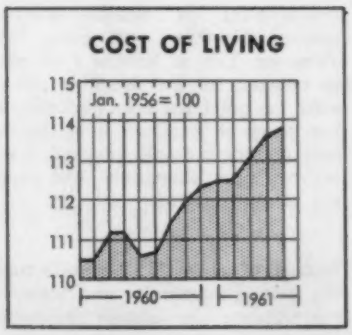
The materials price index (left) predicts increased industrial purchasing soon – thanks in part to defense plans. Imports should benefit as industry modifies inventory policies: Although there are no shortages, business will not feel comfortable with the bare stocks it has been carrying. Yet price rises should be modest unless there is a sudden war scare. The big question: Will steel prices rise next month?

The British Economy: "Austerity" is Not Enough for the 1960s



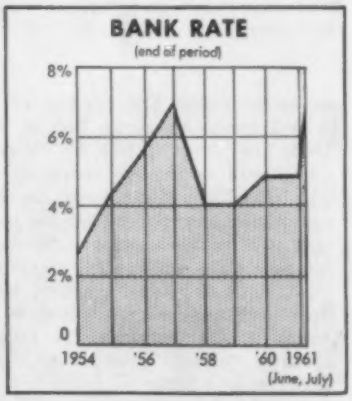






You see some of Britain's problems at left – rising costs; unexciting production growth; exports, though growing, falling behind imports; vulnerable reserves. The government's deflationary measures, highlighted by a 7% bank rate, were producing some desired results last month: The outflow of funds ceased, money started coming back to London. The pound sterling will probably get through the next few months of strain.

But tight credit and taxes to curb home demand are but palliatives, say most observers. What's needed is a long-term effort at cutting costs, raising productivity, becoming more dynamic and competitive in world markets – and in Europe (see p. 1).



McGRAW-HILL INTERNATIONAL MANAGEMENT'S

Last-Minute Memos

Eyes to the east: The British are doing more business with East Europe, as well as with the U.S.S.R. (IM—Aug.). Courtaulds, Ltd., has signed a $5.6-million contract to build an acrylic fiber plant in Lodz, Poland. And Humphrey's & Glasgow, Ltd., will build a plant for the Walter Ulbricht Chemical Works in Leuna, East Germany, in exchange for licenses and technical information for a wide range of Leuna processes.

Trade in cigarettes: France's (and Western Europe's) biggest-selling cigarette, Gauloise, soon will be made and sold in the U.S., and America's Parliament will be available in France, according to a new agreement between the Regie Francaise des Tabacs and U.S.A.'s Philip Morris Inc.

Project discontinued: Britain has stopped research on the production of petroleum out of coal. But development work will continue on several coal gasification projects.

No bad pictures: West Germany's E. Leitz, makers of Leica cameras, has developed an automatic camera that fits into any microscope and "refuses" to take bad pictures. Demonstrated before medical and industrial technicians in New York recently, the camera automatically controls exposure, the shutter, and movement of the film to the next frame. If not enough light is present, the shutter locks and a red light flashes. Leitz believes the camera will prove useful to researchers in steel, chemical, food processing, and other industries as well as to medical science.

Industrial India: The opening of the second Indian Industries Fair at New Delhi on Nov. 14 (the first was in 1955), will display the results of the $23,100-million India and its foreign friends have poured into the economy over the past decade. Made-in-India products will include everything from autos to atomic reactors, while the international section will show the wares of 20 countries. A notable absentee (though present in 1955): Communist China.

Fire-resistant coatings: A paint capable of protecting wood—or even cardboard—from direct blowtorch heat for five minutes or more has been developed by Empire Coatings & Chemicals, Denver, U.S.A. The paint, now being marketed in a wide range of colors, uses intumescent materials that bubble and then char.

Revolutionary typewriter: U.S.A.'s International Business Machines Corp. recently unveiled an electric typewriter that has no type bars or carriage. Priced at $395 to $445, the new "Selectric" types by means of a sphere-shaped element, which can be replaced with other type styles.

Helpful rays: Radiation processing is making headway. U.S.A.'s General Electric Co. recently sold two of its electron-beam resonant transformers to undisclosed foreign buyers for research and pilot-plant work in improving textiles by irradiation. And a group of companies, including U.S.A.'s Litton Industries and Radiation Dynamics Inc., as well as Japan's C. Itoh Corp., are setting up a worldwide network of irradiation service centers. The first centers, scheduled for Paris, Tokyo, and New York, will help companies profitably use atomic rays as a research and processing tool.

Service with a purpose: Fiat, Italy's largest automaker, plans to set up a network of service stations throughout Europe. Besides offering fuel and mechanical work at competitive prices, the stations will promote good-will—and perhaps car sales—for Fiat.

Synthetics for Brazil: An aid to the development of Brazil's poverty-stricken Northeast will come from Firestone Tire & Rubber Co's plans to operate, for the Brazilian government, a polybutadiene synthetic-rubber plant at Recife. It is the first such factory in South America. Large nearby sugar plantations will supply the alcohol needed.

Instead of glass: U.S. manufacturers are getting economies and improved performance in quality household products by replacing glass with styrene, *Modern Plastics* reports. Take the case of Victrylite Candle Co., which until recently made its candelabra out of pressed glass cups mounted on graeful metal stems. By switching to injection-molded styrene cups, Victrylite has not only reduced its production and shipping costs but improved the color and light-reflecting qualities of its product. Or take the high-fashion tumblers being molded out of high-heat-resistant styrene by Loma Industries. They look like crystal-cut glass, but they cost a tenth as much and are virtually unbreakable.

Electronics in Spain: At least 30 companies now are making electronic equipment in Spain, largely from imported components. The industry has grown up quickly, and it is suffering from scarcities in materials and skilled workers. Much of the finished equipment goes to the Middle East.

Cost of living: Living costs for visitors are highest in Caracas, lowest in Cairo, according to the United Nations. With the New York figured as 100, a U.N. report gives these comparative figures: Caracas, 150; Guatemala City, 103; Santiago de Chile, 95; Teheran, 92; New Delhi, 90; Lima, 84; Rome, 81; Copenhagen, 70, Cairo, 62.

Bargains in uranium: The metal responsible for atomic energy soon may be found useful—and economical—for routine factory tasks, according to *Product Engineering*. Natural uranium sells for over $50 a kilo, but when the metal is depleted of its fissionable isotopes, the price comes down to $2.50. As an alloying element, the heavy metal could increase the hardness of copper, and add special properties to aluminum, magnesium and zinc.

Better Exchange: Tourists and foreigners resident in Yugoslavia—including the estimated 35,000 receiving old-age pension checks from the U.S. government—will get 750 dinars per dollar starting Jan. 1, 1942, rather than the present 600. The change is expected to increase Yugoslav tourist business.

We paint 864 parts gold.
Does this make it add better?

No.

But it adds longer.

Most companies that make electric adding machines plate their parts with cadmium to make them last longer.

So do we.

But at Remington we are still not ready to put the machines together.

We take these parts and treat them with an irridite process. This turns them the colour of gold.

It also brings the natural corrosion of metal almost to a complete halt.

You can use a machine made this way anywhere. Under any conditions.

In 10 years it will not suddenly decide that 2 + 2 = 5.

Or start its own multiplication table.

This new machine adds, subtracts, multiplies, divides, totals, and does all the other things you expect with the least chance of corrosion ever making it lie to you.

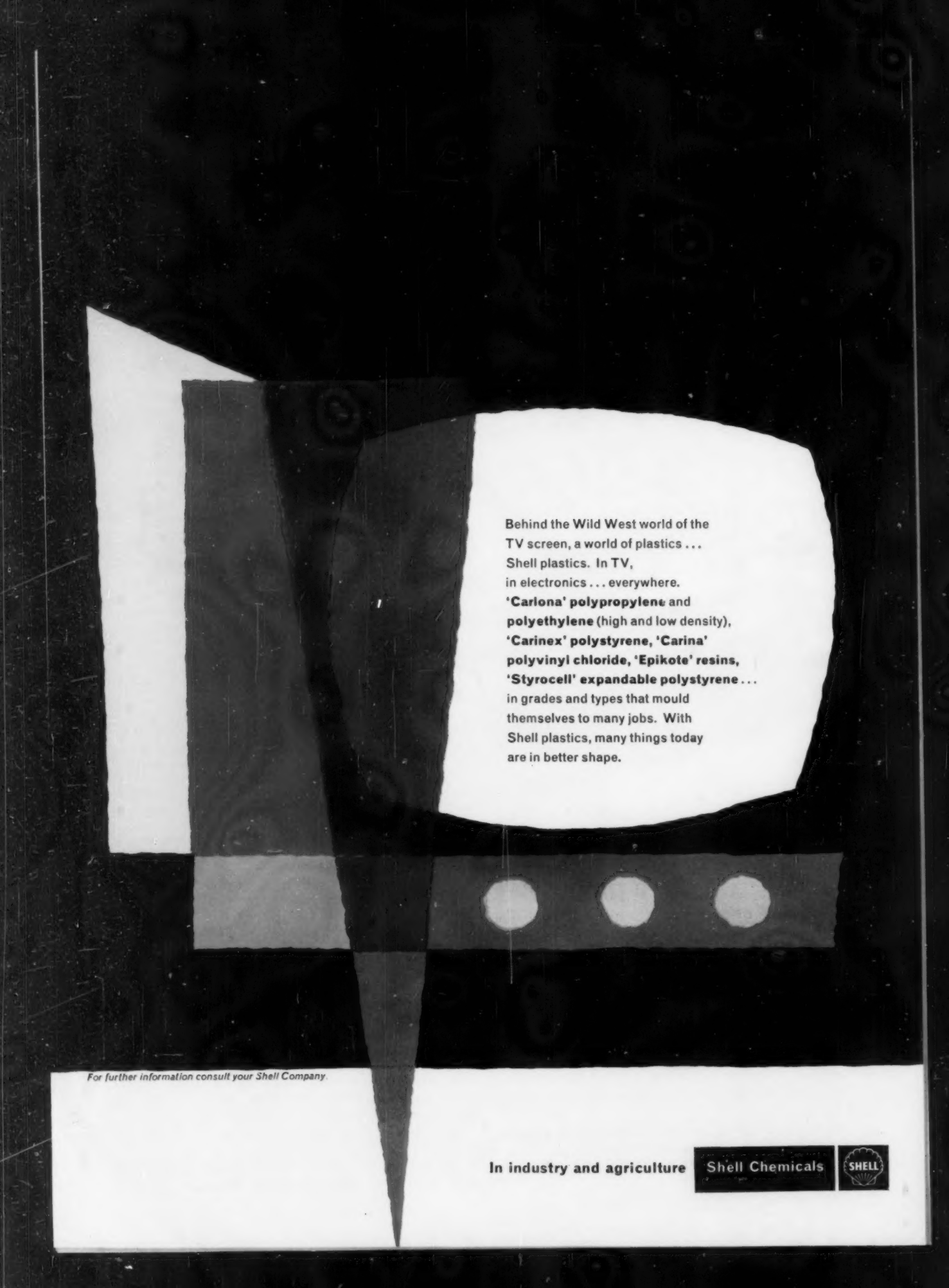
Does it seem funny that Remington should have the gold look inside where you can't see it?

When there are so many companies these days that do it the other way?

Remington Rand

DIVISION OF SPERRY RAND INTERNATIONAL CORP.

FOR FURTHER INFORMATION, CONTACT YOUR LOCAL REMINGTON RAND OFFICE OR WRITE TO REMINGTON RAND INTERNATIONAL, DEPT. IMA 101, 315 PARK AVE. S., N.Y. 10, N.Y.


Behind the Wild West world of the
TV screen, a world of plastics ...
Shell plastics. In TV,
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'Carlona' polypropylene and
polyethylene (high and low density),
'Carinex' polystyrene, 'Carina'
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